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Debt Overhang in Emerging Europe?

Martin Brown
Philip R. Lane

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Abstract

This paper assesses the extent to which debt overhang poses a constraint to economic activity in Emerging Europe, as the region emerges from the recent financial and economic crisis. At the macroeconomic level, it finds that the external imbalance problem for Emerging Europe has been in most cases more one of flows (high current account deficits in the pre-crisis years) rather than large stocks of external debt. A high reliance on equity funding means that net external debt is far lower than net external liabilities. Domestic balance sheets have expanded quite rapidly but sector liabilities remain relatively low compared with advanced economies. With the important exception of Hungary, public debt levels also remain relatively low in Emerging Europe.

At the microeconomic level, the potential for debt overhang in the corporate sector is limited to a few countries: Latvia, Lithuania, Estonia, and Slovenia. Due to the low incidence of household debt, hardly any country, except Estonia, seems to face a threat of debt overhang in the household sector. The strong increase in non-performing loans compared with pre-crisis bank profitability suggests that debt overhang in the banking sector is a threat in Ukraine, Latvia, Lithuania, Hungary, Georgia, and Albania. Financial integration of Emerging Europe seems to have contributed to the transmission of the crisis to the region. At the same time, this integration is helping the region in managing the crisis by concerted actions of the major players.

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by

Martin Brown and Philip R. Lane

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Debt Overhang in Emerging Europe?[1]

1. Introduction

The aim of this background paper is to assess the extent to which debt overhang poses a constraint to economic activity in Emerging Europe, as the region emerges from the recent financial and economic crisis. The analysis covers the new member states of the EU (Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovak Republic, and Slovenia) candidate and potential candidates of the EU (Albania, Bosnia and Herzegovina, Croatia, Macedonia, Serbia and Turkey) and Eastern Partnership countries (Armenia, Georgia, Moldova, Ukraine).

We take a broad view of debt overhang, analyzing both its macroeconomic and microeconomic dimensions. At the macroeconomic level, we examine how external and domestic sectoral balance sheets developed prior to and during the crisis. At the microeconomic level, we assess the distribution of debt across firms and households at the outset and during the crisis. We further examine the loan losses suffered by the banking sector during the crisis and how this may impact on their future lending.

In relation to our macroeconomic analysis, we find that the external imbalance problem for Emerging Europe has been in most cases more one of flows (high current account deficits in the pre-crisis years) rather than large stocks of external debt. A high reliance on equity funding means that net external debt is far lower than net external liabilities. In any event, current account deficits have narrowed quite rapidly in most countries over 2008-2010. In relation to domestic sectoral balance sheets, these have expanded quite rapidly but sectoral liabilities remain relatively low compared to advanced economies. However, the rapid expansion in credit does suggest that non-performing loans could be problematic, due to deterioration in loan quality during intense credit booms. Finally, with the important exception of Hungary, public debt levels remain relatively low in Emerging Europe. So long as the debts of other sectors are not socialized, the risk of sovereign debt crises in these countries seems low compared to many advanced economies.

At the microeconomic level, we first examine whether **debt overhang in the enterprise sector** may constrain future activity in the region. Using data from the EBRD 2009 Business Environment and Enterprise Performance Survey (BEEPS) we identify the share and type of firms which are highly leveraged in each country and assess what this may imply for corporate investment going forward out of the crisis. Comparing the share of highly leveraged firms by country to GDP contraction during the crisis we find that debt overhang is likely to pose a general threat to firm activity in only a limited number of the more advanced countries: Latvia,

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Lithuania, Estonia, and Slovenia. Leverage levels among export-orientated firms and the widespread contraction of export income in the region, suggests, however, that debt overhang in the tradable sector may be an issue for a broader set of countries: Latvia, Lithuania Estonia, Slovenia, Macedonia, Bosnia, Turkey, the Slovak Republic, Serbia, the Czech Republic and Croatia. Finally, our firm-level analysis suggests that despite sharp depreciations in many countries during the crisis, unhedged foreign currency borrowing by firms does not seem to be a source of debt overhang. The countries with a high incidence of unhedged FX loans experienced only minor depreciations during the crisis.

We next examine the potential for **debt overhang in the household sector** by country using data from the 2010 EBRD Life in Transition Survey (LITS). We find that mortgage debt seems to have had a significant adverse impact on household consumption and investment during the crisis. However, due to the low incidence of mortgage debt in the region hardly any country, except Estonia, seems to face a threat of debt overhang. The use of credit cards is much more widespread in the region than mortgage debt. However, credit card use has had a negligible effect on household income and investment during the crisis. It is unlikely therefore that credit card debt may jeopardize future economic activity in the region. Our household-level analysis further suggests that FX mortgages hardly pose a threat to future household consumption and investment. Only a minor fraction of households in the region are exposed to foreign currency mortgages. Moreover those countries in which FX mortgages are most prevalent did not experience major exchange rate shocks during the crisis.

We also assess the potential for **debt overhang in the banking sector** due to the significant loan losses incurred in many countries of the region during the crisis. The strong increase in non-performing loans (NPL) compared to pre-crisis bank profitability suggests that debt overhang in the banking sector is a threat in Ukraine, Latvia, Lithuania, Hungary as well as in Georgia and Albania. In the countries that face the most severe NPL problems, the share of private credit extended to firms (60%) and households (40%) is similar to the sample average. This suggests that debt overhang in the banking sector of these countries is likely to affect both sectors, with firms slightly more affected than households. We further assess the role of foreign banks in mitigating or exacerbating the effects of the crisis in the region. A review of the recent evidence suggests that the financial integration of Emerging Europe has contributed to the transmission of a crisis that had emerged unrelated to the local economic conditions. At the same time, this integration helped the region in managing the crisis by concerted actions of the major players (Vienna Initiative, IMF and EU stabilizing programs).

In the final part of the paper, we examine the policy response in emerging Europe, both in terms of pre-crisis policies and also the policy response during the crisis. We review the lessons from previous crises in terms of dealing with debt overhang issues and offer a brief assessment of current policy measures in emerging Europe.

We find that authorities in most countries have focused on **policy measures to curb FX lending** and cushion the effects of exchange rate depreciations on existing FX borrowers, especially in the household sector. Our analysis suggests that these will have little effect on aggregate investment and consumption in the private sector. While FX lending may be a pressing issue for financial stability, the low levels of unhedged FX borrowing by enterprises and the low incidence of mortgage borrowing among households suggests that this can hardly affect aggregate output.

We discuss recent measures in selected countries (e.g. Latvia and Hungary) to **shift the burden of debt from households to banks**. Our assessment is that these measures may be counterproductive in view of future economic growth: the marginal debt levels of households in the region suggests that over-indebtedness will hardly constrain economic activity in the household sector, while debt overhang in the banking sector seems to already pose a greater threat.

Finally we discuss whether authorities in the region should follow the example of industrialized countries in the recent crisis and East Asian countries at the end of the 1990s by using public funds to **take "toxic" assets off banks' balance sheets**. Our view is that such measures may not be necessary: those countries in the region that have experienced substantial losses in the banking sector are also characterized by a dominance of foreign-owned banks. These banks have shown the ability and willingness to support their subsidiaries in Emerging Europe even in times when they were facing substantial challenges in their home markets. Also, it seems both politically and economically infeasible that authorities in Emerging Europe could use taxpayer funds to subsidize the activities of a predominantly foreign-owned banking sector.

The structure of the rest of this paper is as follows. We provide a brief overview of the debt overhang literature in Section 2. In Section 3, we describe the evolution of the external balance sheets of emerging Europe over the last decade, differentiating between external debt and external equity positions. In addition, we analyze the dynamics of public debt and private-sector debts, plus sectoral balance sheets. We turn to micro-level evidence in Section 4, in which we examine debt levels at the level of firms, households and banks. We conclude with our policy analysis in Section 5.

2. Literature Review

The broad scope of our analysis is inspired by the multifaceted discussion of debt overhang in the microeconomic and macroeconomic literature. The corporate finance literature on debt overhang reaches back to Myers (1977), who demonstrated that the existing level of debt can alter the investment decisions of firms. In his framework, debt overhang refers to a situation where the expected payoff to existing creditors is less than the face value of their claims on the firm. In such a case, the firm must use part of the profits from new investments to pay off existing creditors. Shareholders of limited-liability firms will not internalize this positive "external" effect of their investment activity and may pass up profitable investment opportunities.

In parallel, a narrow definition of debt overhang in the household sector refers to a situation where over-indebted households forego investments in home improvement (Melzer 2010) or household supply of labor (Mulligan 2008). In a broader sense, debt overhang can also refer to the negative impact of household debt on consumption levels, as in Olney (1999).

Debt overhang in the banking sector has been put forward as the major reason for policy interventions to remove toxic assets from bank balance sheets and recapitalize banks during the recent crisis (Philippon and Schnabl, 2009). In analogy to corporate debt overhang, debt overhang in the banking sector is viewed as a situation in which the scale of the debt liabilities of

the banking sector (relative to the value of bank assets) distorts the lending decisions of the banking sector.

In the context of sovereign debt, Krugman (1988) defines debt overhang as a situation in which "the expected present value of future country transfers is less than the current face value of its debt". This corresponds to the notion of a Debt Laffer Curve, by which total repayments decline beyond a threshold level of debt. A Debt Laffer Curve effect exists if the outstanding level of debt distorts investment and labor supply decisions and/or adversely affects economic policies to such an extent that total repayments shrink.

At a macroeconomic level, a common usage is to identify the existence of debt overhang if the outstanding level of debt is associated with a reduction in the rate of economic growth (see Manzano and Rigobon 2001, Cordella et al 2005, Budina et al 2007 and Imbs and Ranciere 2008, among others).[2] Much of the initial literature focused on external debt, since the servicing of external debt has clear macroeconomic implications in terms of requiring a trade surplus in steady state. Typically, this requires an economy to undergo a real exchange rate depreciation. In turn, this can aggravate the debt problem, due to the feedback between the real exchange rate and the real value of the debt burden. In addition, the external dimension is especially interesting, since it is well understood that the enforcement of cross-border debts (especially sovereign debts) is quite problematic.

A large external debt generates an array of economic distortions. The classic example is that high debt acts like a tax on investment, since an expansion in resources will largely be absorbed by increased payments to outstanding creditors (Krugman 1988, Sachs 1989, among others). In similar vein, the incentive for a government to deliver growth-friendly policies is weakened, if domestic residents enjoy only a limited gain from extra output. In addition, a high outstanding level of debt increases fragility in funding markets (Diwan and Rodrik 1992). For instance, the higher level of rollover risk that is associated with a large outstanding stock of debt means that new lenders may be unwilling to provide funds due to the risk of market disruptions.

In turn, the concept of debt overhang inspired many proposals for debt relief during the l980s (Dooley 1986, Fischer 1989, Bulow and Rogoff 1989, amongst many others). In part, the rationale for policy intervention was to coordinate across individual creditors, since the "free rider" problem means that individual creditors have an incentive to hold out for maximum repayment. In part, however, subsidies from international financial institutions were used to bridge the gap between the minimum repayments required by creditors and the maximum repayments that could be tolerated by debtors (Sachs 1989).

The debt relief literature highlights that many different financial engineering solutions, with each allocating the costs of debt relief in different ways. Accordingly, there are critical distributional issues in designing a debt resolution scheme, which can lead to prolonged delays in achieving agreement. In addition to reductions in the net present value of debt, an additional mechanism is to convert debt into an equity claim and/or make the level and timing of repayments contingent on the economic performance of the debtor. Such risk-sharing schemes enable greater transfers to creditors if performance is good. To avoid moral hazard problems,

[2] There is also a recent theoretical literature on debt overhang that emphasizes its role in amplifying business cycles (Aguiar et al 2007, Occhino and Pescatori 2010).

such schemes are ideally based on exogenous factors, such as world interest rates or commodity prices (see Krugman 1988, among others).

In relation to net external liabilities, there has been a major shift away from debt financing towards equity financing for emerging market and developing economies; conversely, many advanced economies have large net foreign debt liability positions that fund positive net foreign equity positions (Lane and Milesi-Ferretti 2007a, Lane and Shambaugh 2010).

In some respects, the debt overhang problem can be interpreted as a liability overhang problem, in the sense that total expected net outward transfers (whether debt payments or equity payments) may influence incentives. Indeed, Lane and Milesi-Ferretti (2007b) emphasize that a high equity component in external liabilities means that more of the upside from future economic growth accrues to foreign investors. Moreover, to the extent that an equity return premium exists, the average level of outward transfers should be higher, the greater is the equity share in external liabilities. However, in the other direction, equity-type liabilities are less risky than debt-type liabilities due to the contingent nature of equity returns. In this way, an adverse macroeconomic shock can amplify the external debt burden but may be hedged in the case of foreign equity liabilities. Accordingly, if tail risk is a major source of debt overhang, this is ameliorated by a greater role for equity-type instruments in external liabilities. Finally, an interesting special case relates to external debt that is intermediated via foreign-owned affiliates in the domestic banking system. In this case, the risk of external debt is attenuated since the equity in the capital base of the foreign-owned domestic banks provides a buffer that can absorb losses in the event of a negative shock.

The accumulated empirical evidence provides some support for the overhang hypothesis in relation to external debt. Cordella et al (2005) study 79 developing countries over 1970-2002 and find external debt above 15%-30% is associated with lower growth performance for those countries with good institutions.[3] Imbs and Ranciere (2008) study 87 developing countries over 1969-2002 and find a negative growth effect if the face value of external debt exceeds 60 percent of GDP (or if the present value of debt exceeds 40 percent of GDP). Moreover, they identify some mechanisms by which debt overhang operates. In particular, they show that investment declines and the conduct of economic policy deteriorates in the debt overhang zone. According to the authors, these results are mostly driven by countries with poor property rights and underdeveloped financial markets, under which external monitoring of borrowers is most difficult.[4]

Reinhart and Rogoff (2010) study the relation between external debt and growth performance for a group of twenty emerging market economies over a 200-year period. In bivariate statistical analysis, these authors find a threshold of 60 percent of GDP, with a lower growth rate observed for countries with higher external debt levels.

However, all of these studies focus on developing country studies. One reason is that there are no similar, long datasets on the external debts of advanced economies (partly due to the

[3] These authors find that is no robust relation between debt and growth for countries with weak institutions. One possibility is that debt rescheduling is fully expected for such countries.

[4] Arsanalp and Henry (2004) provide related evidence using data on the impact of announcements of debt relief schemes on asset prices.

lower incidence of default on external debt among high-income countries). Accordingly, their relevance to advanced economies may be limited, in view of the greater degree of financial development and other structural differences. Moreover, the phenomenon of significant foreign equity liabilities is relatively recent (only growing rapidly since the early 2000s), such that studies concerning external debt do not necessarily carry over to total external liabilities. Finally, these studies consider gross external debt. While foreign debt assets for these types of countries might have been relatively small in earlier periods, the growth in reserve positions over the last decade means that there is a large divergence between gross external debt liabilities and net external debt liabilities for many countries.

As noted above, the debt overhang concept can also apply at the sectoral level and at the level of individual banks, firms and households in addition to the external dimension. There is a growing literature that shows that high public debts are associated with lower output growth (Checherita and Rother 2010, Kumar and Woo 2010, Reinhart and Rogoff 2010).

Kumar and Woo (2010) study a panel of 38 advanced and emerging economies over 1970 to 2007. These authors find that public debt ratios above 90 percent are associated with lower subsequent output growth, with the growth penalty substantially larger for emerging markets than for advanced economies. In particular, these authors estimate that a 10 percentage point increase in the debt ratio is associated with a growth slowdown of 0.15-0.2 percent in advanced economies but 0.3-0.4 percent in emerging economies. Moreover, they find that reduced investment is a key driver of the deterioration in growth performance.

In a study of euro area member countries over 1970-2009, Checherita and Rother (2010) also find a negative growth threshold of around 90-100 percent for the debt ratio. However, these authors caution that the lower-bound confidence interval of 70-80 percent calls for greater prudential policies at lower debt levels. In terms of mechanics, these authors find that high public debt adversely affects growth through several channels, including reductions in private saving and TFP growth. In a study of forty-four countries over two hundred years, the statistical analysis of Reinhart and Rogoff (2010) also suggests a 90 percent threshold ratio of public debt, beyond which growth performance deteriorates.

It is important to emphasize that private-sector debt problems can induce a sovereign debt crisis. Most directly, a government may choose to take over private liabilities, either for efficiency reasons or in response to political pressures. In turn, the existence of an implicit fiscal backstop may lead to lower repayment discipline among private-sector creditors, especially if debt problems are sufficiently widespread in the population to render punishment threats incredible (Arellano and Kocherlakota 2008). A similar logic applies if banks are taken into public ownership and private-sector debtors believe that government-owned banks will take a softer line in enforcing repayment. Accordingly, governments face a difficult problem in designing resolution schemes for private-sector debts, in view of such moral hazard problems.

In relation to sectoral debt overhang, the literature on the output losses associated with banking crises is extensive (see Cerra and Saxena 2008, Furceri and Mourougane 2009 and International Monetary Fund 2009 for recent studies). There is also some evidence that excessive leverage at corporate and household levels may also damage macroeconomic performance (Laeven and Laryea 2009, Laryea 2010).

In summary, the research literature provides an array of theoretical mechanisms that can generate a debt overhang effect, at either aggregate or sectoral levels. Moreover, the empirical evidence does suggest that excessively-high debt levels can weigh down on macroeconomic or sectoral economic performance. However, the potential gains to any type of debt forgiveness program have to be set against the possible short-term and long-term costs of writing down debt levels. In relation to the short-term costs, debt renegotiation costs can be substantial (both in terms of lost output and financial reputation), depending on the level of cooperation between creditors and debtors (see Panizza et al 2009 for a recent survey). As indicated above, there is also the moral hazard risk by which the existence of a debt forgiveness program may reduce repayment discipline even among those that would meet their commitments under a stricter regime. In relation to the longer term, the weakening of creditor rights in a debt forgiveness program may raise the long-term cost of capital (Shleifer 2003).

Furthermore, in terms of quantitative guidance, the empirical literature offers only indicative evidence. In particular, the bulk of the studies relate to lower-income countries, such that the guidance in terms of debt thresholds for advanced or upper middle income economies may be quite limited. Moreover, the results are sensitive to sample selection and the choice of conditioning variables. Accordingly, in what follows, we mainly focus on cross-country and cross-group comparisons rather than seeking to place each country on either side of a fixed threshold.

3. External and Domestic Balance Sheets

3.1 External Balance Sheets

In this section, we examine the evolution of the external balance sheets of emerging Europe. A highly-negative net foreign asset position may signal sustainability problems. In particular, if a substantial improvement in the net foreign asset position is required to ensure sustainability, this will typically require a turnaround in the trade balance. In turn, this may induce substantial real exchange rate depreciation (Lane and Milesi-Ferretti 2004). In addition, import compression may be achieved through a contraction in domestic demand, such that external adjustment may be associated with domestic recessionary forces. The social and economic costs of this dynamic may tempt a country with large net external liabilities to look to debt restructuring or international financial assistance in order to smooth out the adjustment process.

Table 3.1 shows the net foreign asset position for the individual emerging European countries for three years: 2002, 2007 and 2009. There is a clear difference between the EU new member states and the other countries in terms of the growth in the net external position during the pre-crisis period. In particular, there was a near doubling of the net external liabilities of the former group between 2002 and 2007, whereas there was only a marginal deterioration for the latter group. Both groups have seen further deterioration between 2007 and 2009 but the gap between the two groups has closed slightly.

Table 3.1a shows that the net foreign liability positions of the emerging European regions are much more negative than for emerging Asia and emerging Latin America. The comparison with the Euro Periphery shows an important difference: whereas the expansion in net external

liabilities between 2002 and 2007 was similar across the two areas, the net external liabilities of the Euro Periphery continued to grow rapidly after 2007, whereas emerging Europe has seen a much smaller deterioration during the crisis.

Table 3.1. Net Foreign Assets, Percent of GDP

	Country	2002	2007	2009
New Member States	Bulgaria	-30	-95	-117
	Czech Republic	-18	-45	-47
	Estonia	-60	-79	-84
	Hungary	-74	-96	-129
	Latvia	-44	-80	-87
	Lithuania	-37	-60	-62
	Poland	-38	-58	-66
	Romania	-24	-50	-66
	Slovak Republic	-27	-61	-73
	Slovenia	-2	-25	-39
Candidates and Potential Candidates	Albania	-14	-28	-50
	Bosnia and Herzegovina	-29	-36	-57
	Croatia	-30	-103	-86
	Macedonia, FYR	-40	-47	-66
	Serbia	n/a	n/a	n/a
	Turkey	-37	-49	-45
Eastern Partnership Countries	Armenia	-64	-23	-48
	Georgia	-64	-84	-121
	Moldova	-93	-62	-76
	Ukraine	-29	-23	-39

Source: Updated EWN dataset based on Lane and Milesi-Ferretti (2007). Note: This table reports foreign asset minus foreign liabilities.

Table 3.1a. Net Foreign Assets, Percent of GDP

Country	2002	2007	2009
Euro Periphery	-48	-77	-102
Emerging Latin America	-47	-24	-24
Emerging Asia	-15	0	-10
New Member States	-35	-65	-77
Candidates and Potential Candidates	-30	-52	-61
Eastern Partnership Countries	-63	-48	-71

Source: Updated EWN dataset based on Lane and Milesi-Ferretti (2007). Note: These tables report foreign asset minus foreign liabilities.

It might be argued that the debt component of the external balance sheet poses more problems than the equity component in relation to overhang issues. Accordingly, we show the net debt and net equity positions in Table 3.2. For the new member states, Table 3.2 shows sizeable growth in net debt liabilities between 2002 and 2007, from 2 percent of GDP to 18 percent of GDP. There has been further expansion during the crisis, rising to 27 percent of GDP in 2009. Table 3.2 also shows that net equity liabilities are far greater than net debt liabilities for the new member states. Moreover, the relative stability of net equity positions between 2007 and 2009 also highlights the stabilizing role played by equity-type liabilities - the value of these liabilities naturally falls with a decline in performance in these economies.

A similar message holds for the other countries. Indeed, net debt liabilities for this group actually fell between 2002 and 2007, before increasing during the crisis period. Between 2002 and 2007, these countries saw rapid growth in net equity liabilities. Figure 3.1 shows the scatter of net equity versus net debt positions for 2009 for the whole sample of countries.

Table 3.2. Net Debt and Equity IIP, Percent of GDP

		Net Debt			Net Equity		
	Country	2002	2007	2009	2002	2007	2009
New Member States	Bulgaria	-8	0	-12	-23	-95	-105
	Czech Republic	33	14	9	-51	-60	-56
	Estonia	-4	-33	-37	-57	-47	-46
	Hungary	-19	-44	-60	-56	-51	-68
	Latvia	-14	-46	-46	-29	-34	-40
	Lithuania	-8	-27	-33	-28	-34	-29
	Poland	-12	-16	-26	-26	-42	-40
	Romania	-6	-11	-21	-18	-39	-45
	Slovak Republic	9	-3	-15	-36	-58	-58
	Slovenia	11	-15	-28	-13	-10	-10
Candidates and Potential Candidates	Albania	9	5	-7	-22	-33	-42
	Bosnia and Herzegovina	-17	-1	-18	-12	-35	-39
	Croatia	-12	-29	-39	-18	-73	-47
	Macedonia, FYR	-8	2	-9	-32	-49	-57
	Serbia						
	Turkey	-30	-17	-19	-7	-31	-26
Eastern Partnership Countries	Armenia	-36	4	-6	-29	-27	-42
	Georgia	-38	-19	-34	-26	-65	-87
	Moldova	-55	-20	-27	-38	-42	-49
	Ukraine	-14	5	5	-15	-27	-45

Source: Updated EWN dataset based on Lane and Milesi-Ferretti (2007). Note: This table reports net debt which is international debt assets plus foreign exchange reserves minus international debt liabilities, and net equity which is international equity assets minus international equity liabilities.

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Table 3.2a compares the evolution of net debt and net equity for Emerging Europe to the Euro Periphery, Emerging Latin America and Emerging Asia. There are some striking differences across these regions. While emerging economies in Latin America and Asia accumulated positive net debt positions between 2002 and 2009, only the Eastern Partnership bloc in Europe saw a reduction in net debt liabilities. In contrast, the growth in net debt liabilities was most rapid for the Euro Periphery and the new member states.

Table 3.2a. Net Debt and Equity IIP, Percent of GDP

Country	Net Debt			Net Equity		
	2002	2007	2009	2002	2007	2009
Euro Periphery	29	-3	-20	-78	-73	-81
Emerging Latin America	-23	3	7	-24	-27	-30
Emerging Asia	0	27	35	-14	-27	-17
New Member States	-2	-18	-27	-34	-47	-50
Candidates and Potential Candidates	-12	-8	-18	-18	-44	-42
Eastern Partnership Countries	-36	-8	-16	-27	-40	-55

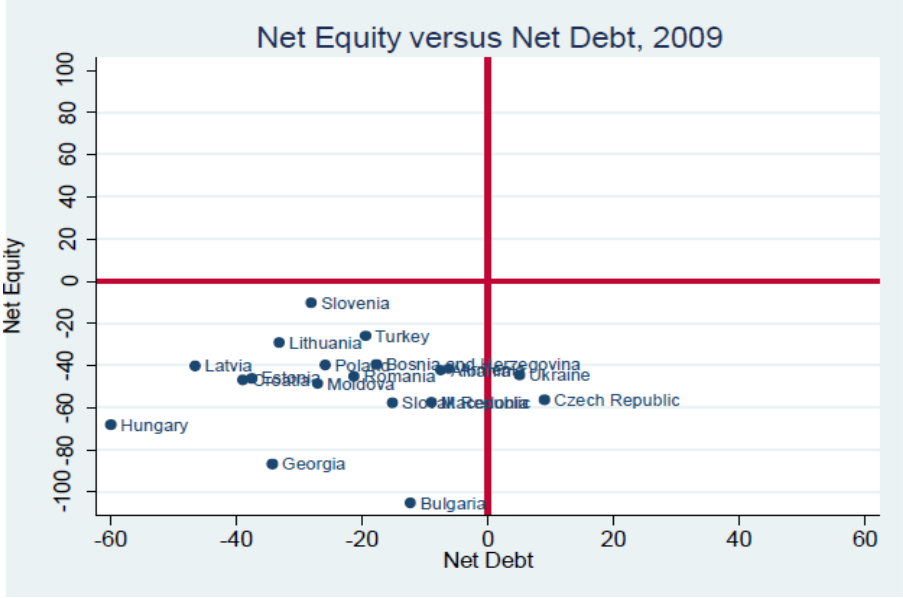
Source: Updated EWN dataset based on Lane and Milesi-Ferretti (2007).
Note: These tables report net debt which is international debt assets plus foreign exchange reserves minus international debt liabilities, and net equity which is international equity assets minus international equity liabilities.

In relation to net equity positions, these were relatively stable for the Euro Periphery, Emerging Latin America and Emerging Asia, whereas net equity liabilities grew significantly for each region in Emerging Europe.

We dig deeper into the net debt positions in Table 3.3. In particular, we recognize that gross debt liabilities matter, in addition to the net position. This is especially the case during periods of market turmoil, in which gross debt liability positions may have to be rolled over or redeemed, while not all types of gross debt assets might be fully liquid or available to net off

against the liabilities. In addition, it is helpful to keep track of the scale of foreign reserve assets, since these can provide a useful source of foreign-currency liquidity in the event of market disruption.

Figure 3.1. Net Foreign Debt and Net Foreign Equity Positions, 2009, % GDP



Source: Updated EWN dataset based on Lane and Milesi-Ferretti (2007). Note: This table reports net debt which is international debt assets plus foreign exchange reserves minus international debt liabilities, and net equity which is international equity assets minus international equity liabilities.

Table 3.3. Gross Debt and Foreign Reserves, Percent of GDP

		Gross Debt			Foreign Exchange Reserves		
	Country	2002	2007	2009	2002	2007	2009
New Member States	Bulgaria	69	68	73	28	42	36
	Czech Republic	29	38	41	31	20	22
	Estonia	49	96	106	14	15	21
	Hungary	50	93	119	15	17	34
	Latvia	67	125	145	13	19	26
	Lithuania	37	69	78	17	19	17
	Poland	37	44	52	14	15	18
	Romania	32	40	58	13	22	26
	Slovak Republic	47	45	60	36	24	1
	Slovenia	48	96	108	30	2	2
Candidates and Potential Candidates	Albania	25	27	34	19	20	19
	Bosnia and Herzegovina	54	50	54	20	30	19
	Croatia	54	73	80	22	23	22
	Macedonia, FYR	44	43	46	19	26	22
	Serbia						
	Turkey	54	41	44	12	11	12
Eastern Partnership Countries	Armenia	64	26	55	17	18	23
	Georgia	54	39	61	6	13	20
	Moldova	99	64	69	16	30	27
	Ukraine	51	54	84	10	22	22

Source: Updated EWN dataset based on Lane and Milesi-Ferretti (2007). Note: This table reports international debt liabilities as a percentage of GDP and foreign exchange reserves.

In relation to the new member states, Table 3.3 shows that the Baltic States and Hungary saw a very rapid expansion in gross debt liabilities between 2002 and 2007 but that the scale of

gross debt liabilities was much smaller for the other countries. An important exception is Slovenia, which shows gross debt levels that are more similar to other higher-income members of the euro area. For the new member states, foreign reserve assets are quite substantial (with the exceptions of those who had joined the euro area during this period), providing a buffer against foreign-currency shortages.

Turning to the group of other countries, gross debt liabilities actually fell for these countries between 2002 and 2007. However, there was some deterioration between 2007 and 2009 for most of these countries, while Ukraine saw a very large jump in gross debt liabilities (relative to GDP). In terms of foreign reserve assets, these countries look very similar to the new member states in maintaining foreign reserve assets at around 20 percent of GDP.

Table 3.3a shows the comparative cross-regional data. All emerging regions show gross external debt liabilities that are far below the levels of the Euro Periphery, reflecting a much lower degree of cross-border financial integration. However, across the emerging regions, it is striking that Latin America and Asia witnessed sizeable declines in gross debt liabilities in the 2002-09 period, while the new member states underwent a doubling in gross debt liabilities.

Table 3.3a. Gross Debt and Foreign Reserves, Percent of GDP

	Gross Debt			Foreign Exchange Reserves		
Country	2002	2007	2009	2002	2007	2009
Euro Periphery	184	315	370	6	0	1
Emerging Latin America	61	34	32	10	13	15
Emerging Asia	46	37	36	29	36	43
New Member States	46	71	84	21	20	20
Candidates and Potential	46	47	51	18	22	19
Eastern Partnership Countries	67	46	67	12	21	23

Source: Updated EWN dataset based on Lane and Milesi-Ferretti (2007). Note: These tables report international debt liabilities and foreign exchange reserves.

Tables 3.4a to 3.4g provide further insight into the gross external debt positions of these countries. Table 3.4a shows total cross-border loans from BIS-reporting banks. Bank loans grew very rapidly between 2002 and 2007, especially for the Baltic States. Since 2007, there has been a degree of deleveraging for many countries. Table 3.4b isolates the cross-border loans made to non-banks: these are only a small proportion of total cross-border loans for most countries. Rather, cross-border loans are typically intermediated via the domestic banking system.

In relation to foreign reserves, the Euro Periphery held very low levels of foreign reserves, in line with membership of a common currency area. While Emerging Europe holds more foreign reserves than Emerging Latin America as a ratio to GDP, the level is far below Emerging Asia. While the Eastern Partnership countries did increase reserve levels between 2002 and 2009, this was not the case for the other regions in Emerging Europe, despite the rapid growth in gross external debt liabilities.

Table 3.4c reports the stock of international debt securities issued by each country. It shows that this is not a major source of external debt financing, with the exceptions of Hungary, Lithuania and Slovenia. As is shown in Table 3.4d, it is striking that the non-banks are the

dominant issuers of international debt securities, which is in contrast to the more central role played by bank bonds in some advanced economies.

Table 3.4a. Loans from Banks, Percent of GDP

	Country	2002	2007	2009	2010
New Member States	Bulgaria	6	29	40	36
	Czech Republic	14	18	15	14
	Estonia	15	60	68	55
	Hungary	15	32	52	50
	Latvia	9	67	71	64
	Lithuania	6	39	43	34
	Poland	8	14	18	19
	Romania	6	26	34	31
	Slovakia	10	20	12	14
	Slovenia	17	60	54	51
Candidates and Potential Candidates	Albania	1	3	6	7
	Bosnia and Herzegovina	7	23	24	20
	Croatia	22	49	58	54
	Macedonia, FYR				
	Serbia				
	Turkey	14	17	19	16
Eastern Partnership Countries	Armenia	1	2	3	3
	Georgia	5	4	4	3
	Moldova	4	9	9	6
	Ukraine	2	16	18	14

Source: BIS. Note: This table reports cross-border loans from BIS banks.

Table 3.4b. Loans from Banks to Nonbanks, Percent of GDP

	Country	2002	2007	2009	2010
New Member States	Bulgaria	2	16	20	20
	Czech Republic	6	9	9	8
	Estonia	7	14	12	11
	Hungary	6	13	23	21
	Latvia	2	13	15	15
	Lithuania	3	9	9	6
	Poland	4	6	7	7
	Romania	5	10	15	13
	Slovakia	6	7	9	9
	Slovenia	9	19	22	23
Candidates and Potential Candidates	Albania	0	1	5	6
	Bosnia and Herzegovina	6	6	8	7
	Croatia	10	30	34	34
	Macedonia, FYR				
	Serbia				
	Turkey	11	12	13	10
Eastern Partnership Countries	Armenia	0	1	2	1
	Georgia	3	1	2	3
	Moldova	2	2	2	2
	Ukraine	1	5	6	5

Source: BIS. Note: This table reports cross-border loans from BIS banks to nonbanks.

Table 3.4e shows the consolidated liabilities to BIS-reporting banks. The consolidated data take into account local lending by the domestic affiliates of foreign-owned banks, while netting out any cross-border loans by the foreign affiliates of domestically-owned banks. Taken in tandem with the locational data reported in Table 3.4f, these data show that local lending by foreign-owned affiliates are a substantial component of the total exposure of foreign banks in these countries. As indicated in Section 2, a high level of foreign ownership in the banking

system reduces the risk associated with high external or local debt, since there is a foreign equity buffer to absorb losses in the event of a banking crisis. However, in the other direction, it is also possible that foreign-owned banks are more vulnerable to external credit crises that may induce parent banks to pull back from all locations. These issues are explored further section 4.3.

Table 3.4c. International Debt Securities, Percent of GDP

	Country	2002	2007	2009	2010
New Member States	Bulgaria	26	5	5	4
	Czech Republic	3	5	10	12
	Estonia	9	8	3	3
	Hungary	16	25	30	28
	Latvia	5	5	6	6
	Lithuania	11	15	22	29
	Poland	4	10	12	13
	Romania	6	3	3	3
	Slovakia	12	7	9	10
	Slovenia	10	8	29	36
Candidates and Potential Candidates	Albania	6	2	2	2
	Bosnia and Herzegovina	0	0		
	Croatia	20	13	12	13
	Macedonia, FYR				
	Serbia				
	Turkey	10	6	7	6
Eastern Partnership Countries	Armenia				
	Georgia	0	2	6	8
	Moldova	0	0	0	0
	Ukraine	6	9	10	9

Source: World Bank, Joint External Debt Hub. Note: This table reports international debt securities, all maturities.

Table 3.4d. International Debt Securities, Nonbanks, Percent of GDP

	Country	2002	2007	2009	2010
New Member States	Bulgaria	26	5	5	4
	Czech Republic	1	4	9	11
	Estonia	5	2	3	3
	Hungary	15	19	24	23
	Latvia	5	3	4	5
	Lithuania	11	15	22	29
	Poland	4	10	12	13
	Romania	6	2	2	3
	Slovakia	12	7	9	10
	Slovenia	9	7	22	29
Candidates and Potential Candidates	Albania	6	2	2	2
	Bosnia and Herzegovina				
	Croatia	19	9	10	11
	Macedonia, FYR				
	Serbia				
	Turkey	10	6	7	6
Eastern Partnership Countries	Armenia				
	Georgia	0	0	5	7
	Moldova	0	0	0	0
	Ukraine	6	6	7	7

Source: World Bank, Joint External Debt Hub. Note: This table reports international debt securities, nonbanks.

Table 3.4e. Liabilities to Banks, Consolidated, Percent of GDP

	Country	2002	2007	2009	2010
New Member States	Bulgaria	13	55	67	60
	Czech Republic	19	26	21	19
	Estonia	74	111	120	115
	Hungary	35	69	80	74
	Latvia	20	90	105	100
	Lithuania	19	53	72	62
	Poland	16	25	31	31
	Romania	10	54	49	46
	Slovakia	21	38	20	16
	Slovenia	24	57	44	42
Candidates and Potential Candidates	Albania	4	19	27	28
	Bosnia and Herzegovina	10	40	29	27
	Croatia	44	103	79	86
	Macedonia, FYR				
	Serbia				
	Turkey	14	18	18	15
Eastern Partnership Countries	Armenia	1	3	5	6
	Georgia	6	4	8	11
	Moldova	6	6	13	10
	Ukraine	2	22	19	17

Source: BIS. Note: This table reports liabilities to BIS banks, consolidated total.

Table 3.4f. Liabilities to Banks, Locational, Percent of GDP

	Country	2002	2007	2009	2010
New Member States	Bulgaria	12	40	49	46
	Czech Republic	18	28	24	23
	Estonia	27	85	92	81
	Hungary	28	56	72	69
	Latvia	13	71	77	71
	Lithuania	11	49	54	46
	Poland	13	26	28	29
	Romania	7	33	39	36
	Slovakia	15	29	21	23
	Slovenia	23	69	65	64
Candidates and Potential Candidates	Albania	4	6	11	11
	Bosnia and Herzegovina	8	29	29	24
	Croatia	28	73	72	67
	Macedonia, FYR				
	Serbia				
	Turkey	16	21	22	20
Eastern Partnership Countries	Armenia	1	2	4	3
	Georgia	5	4	4	5
	Moldova	4	11	10	8
	Ukraine	2	20	22	17

Source: BIS. Note: This table reports liabilities to BIS banks, locational total.

Finally, Table 3.4g shows that the importance of official multilateral lending has grown since the onset of the crisis. The biggest growth during the crisis has been concentrated on Latvia, Hungary, Romania and the Ukraine.

Tables 3.4h to 3.4m provide analogous data to Tables 3.4a to 3.4g but on an inter-regional comparative basis. Table 3.4h shows that international banks are significant cross-border creditors of the Euro Periphery, the new member states and the group of candidates and potential candidates, but that these bank liabilities are much smaller for the other emerging regions. Table 3.4i reinforces the point that the domestic banking system is the main local

counter-party for cross-border bank loans across all regions, with the non-bank sector not a major originator of cross-border liabilities.

Table 3.4g. Multilateral Loans, Percent of GDP

	Country	2002	2007	2009	2010
New Member States	Bulgaria	12.6	3.8	3.1	2.9
	Czech Republic	0.2	0.0	0.0	0.0
	Estonia	0.5	0.1	0.1	0.1
	Hungary	0.8	0.1	9.3	9.2
	Latvia	3.0	0.3	5.6	8.2
	Lithuania	2.8	0.1	0.1	0.1
	Poland	1.2	0.4	1.0	1.3
	Romania	5.7	1.5	7.8	11.5
	Slovakia	0.8	0.4	0.3	0.2
	Slovenia	0.3	0.1	0.0	0.0
Candidates and Potential Candidates	Albania	12.5	8.4	7.7	8.1
	Bosnia and Herzegovina	18.9	10.0	10.6	12.4
	Croatia	2.2	1.9	2.0	2.6
	Macedonia, FYR				
	Serbia				
	Turkey	11.9	2.3	2.9	2.4
Eastern Partnership Countries	Armenia	30.8	12.2	22.6	23.8
	Georgia	23.5	11.1	20.6	22.6
	Moldova	29.1	13.5	11.0	13.8
	Ukraine	9.7	1.9	12.2	11.8

Source: World Bank, Joint External Debt Hub. Note: This table reports multilateral loans, total.

In terms of the issuance of international debt securities, Tables 3.4j and 3.4k show that Emerging Europe has a similar profile to Emerging Asia and Emerging Latin America, with cross-border bond debt much smaller than cross-border loans.

Table 3.4h. Loans from Banks, Percent of GDP

	2002	2007	2009	2010
Euro Periphery	70	116	131	128
Emerging Latin America	14	8	9	8
Emerging Asia	13	13	11	11
New Member States	11	37	41	37
Candidates and Potential Candidates	11	23	27	24
Eastern Partnership Countries	3	8	8	7

Source: BIS. Note: This table reports cross-border loans from BIS banks.

Table 3.4i. Loans from Banks to Nonbanks, Percent of GDP

	2002	2007	2009	2010
Euro Periphery	16	29	33	35
Emerging Latin America	10	5	6	4
Emerging Asia	5	4	4	4
New Member States	5	12	14	13
Candidates and Potential Candidates	7	12	15	14
Eastern Partnership Countries	2	2	3	3

Source: BIS. Note: This table reports cross-border loans from BIS banks to nonbanks.

Finally, Tables 3.4l and 3.4m show some striking differences in the structure of cross-border banking across the region. In the Euro Periphery, the consolidated exposures of international banks is much smaller than the locational exposures, reflecting the role of the Euro Periphery in re-intermediating wholesale bank flows (primarily in Ireland). In Emerging Latin America and Emerging Asia, there is little difference between consolidated and locational

exposures. However, in Emerging Europe, consolidated exposures are substantially above locational exposures, reflecting the important role of foreign-owned banks in the domestic banking sector of this region.

Table 3.4j. International Debt Securities, Percent of GDP

	2002	2007	2009	2010
Euro Periphery	41	156	220	227
Emerging Latin America	25	15	12	10
Emerging Asia	12	9	10	9
New Member States	10	9	13	14
Candidates and Potential Candidates	9	5	7	7
Eastern Partnership Countries	2	4	6	6

Source: World Bank, Joint External Debt Hub. Note: This table reports international debt securities, all maturities.

Table 3.4k. International Debt Securities, Nonbanks, Percent of GDP

	2002	2007	2009	2010
Euro Periphery	31	112	167	172
Emerging Latin America	24	14	11	9
Emerging Asia	10	8	8	8
New Member States	9	7	11	13
Candidates and Potential Candidates	12	6	6	6
Eastern Partnership Countries	2	2	4	5

Source: World Bank, Joint External Debt Hub. Note: This table reports international debt securities, nonbanks.

Table 3.4l. Liabilities to Banks, Consolidated, Percent of GDP

	2002	2007	2009	2010
Euro Periphery	73	130	125	114
Emerging Latin America	17	12	13	11
Emerging Asia	14	15	15	16
New Member States	25	58	61	57
Candidates and Potential Candidates	18	45	38	39
Eastern Partnership Countries	4	9	11	11

Source: BIS. Note: This table reports liabilities to BIS banks, consolidated total.

Table 3.4m. Liabilities to Banks, Locational, Percent of GDP

	2002	2007	2009	2010
Euro Periphery	100	182	199	184
Emerging Latin America	17	11	11	10
Emerging Asia	16	17	15	15
New Member States	17	49	52	49
Candidates and Potential Candidates	11	26	27	25
Eastern Partnership Countries	3	9	10	8

Source: BIS. Note: This table reports liabilities to BIS banks, locational total.

Finding 3.1: External Debt Liabilities

- The rapid growth in external liabilities has led some countries to seek official assistance (Latvia, Hungary, Romania, Ukraine).
- However, the overall external liability position exaggerates the debt problem for most countries in the sample, in view of the importance of equity financing.
- The high level of foreign reserves in most countries also provides a buffer against external funding problems.

3.2 Domestic Exposures

In the previous subsection, we focused on the aggregate external balance sheet of countries. However, the sectoral distribution of external liabilities also matters. In addition, purely domestic liabilities between sectors also can have macroeconomic consequences.

In this subsection, we first examine the evolution of government debt. Next, we consider the aggregate indebtedness of the private sector. Subsequently, we consider the balance sheets of banks, households and non-financial corporations.

Sovereign debt is distinct from private-sector debt for several reasons. First, it is well understood that there can only be limited enforcement of sovereign debt claims. Rather, the repayment of sovereign debt depends on the willingness and ability to pay of the government. If the implications for its taxation and spending decisions are too onerous or if it is unable to raise new funding, a sovereign government may seek rescheduling or default on its debt.

Second, a sovereign government can take a broad perspective on the macroeconomic implications of its debt liabilities. In particular, a sovereign will internalize the implications of the level of sovereign debt for the prospective growth rate of the economy, since it cares both directly about the living standards of its citizens and also indirectly about the revenue consequences of a low growth rate. In contrast, private-sector entities may fail to take into account the externalities associated with high individual debt levels, leading to an over-borrowing situation relative to the social optimum.

Third, the bargaining position of a sovereign vis-à-vis its creditors is different relative to private-sector entities. In addition to its legislative autonomy, the scale of sovereign debt dwarfs any that of any individual private-sector entity, such that its leverage vis-à-vis its creditors is the greater. However, in the other direction, the sovereign will also internalize the possible economic and social costs of the disruption that is typically associated with debt default events.

Table 3.5 shows the public debt levels for each country. For the new member states, public debt ratios fell between 2002 and 2007 to a relatively-low mean of 25 percent of GDP. During the crisis, the average level has climbed to 35 percent. The main country of concern is Hungary, where the debt level in 2009 stood at 78 percent. In contrast, the Baltic States had much lower public debt levels, even if the Latvian debt ratio has grown quickly between 2007 and 2009.

In relation to the other countries, this group also saw a sizeable reduction in public debt levels between 2002 and 2007 from 53 percent to 30 percent. For this group, the increase in public debt during the crisis was quite mild, rising only to 37 percent of GDP.

Table 3.5a shows that the levels of public debt in emerging Europe are far behind the Western European periphery and are also below the levels in emerging Asia and emerging Latin America. Of course, the measured level of public debt does not fully capture sovereign exposures. A sovereign may be also be liable for the debts incurred through off balance sheet maneuvers and public enterprises, while the central government may also be the effective guarantor for the debts of sub-national levels of government. In addition, the level of public debt can quickly rise if a government opts to take over the debts incurred by private-sector entities or inject capital into over-leveraged enterprises. The financial health of the government also

depends on the extent of implicit liabilities, such as unfunded pension commitments for an aging population.

Table 3.5. Government Debt, Percent of GDP

	Country	2002	2007	2009
New Member States	Bulgaria	52	17	15
	Czech Republic	28	29	35
	Estonia	6	4	7
	Hungary	56	66	78
	Latvia	14	9	37
	Lithuania	22	17	30
	Poland	42	45	51
	Romania	25	13	24
	Slovak Republic	43	30	35
	Slovenia	28	23	35
Candidates and Potential Candidates	Albania	65	54	60
	Bosnia and Herzegovina	32	33	35
	Croatia	40	33	35
	Macedonia, FYR	49	32	21
	Serbia			
	Turkey	93	39	45
Eastern Partnership Countries	Armenia	37	16	41
	Georgia	53	22	37
	Moldova	73	27	28
	Ukraine	34	12	35

Source: Eurostat, Abbas et al (2010).

Table 3.5a. Government Debt, Percent of GDP

	2002	2007	2009
Euro Periphery	61	55	78
Emerging Latin America	75	46	44
Emerging Asia	47	38	42
New Member States	32	25	35
Candidates and Potential Candidates	56	38	39
Eastern Partnership Countries	49	19	35

Source: Eurostat, Abbas et al (2010).

In relation to private-sector indebtedness, a useful aggregate indicator is the ratio of private credit to GDP.[5] Table 3.6 shows the evolution of this measure, using World Bank data. For the new member states, this ratio grew quickly between 2002 and 2007 and continued to climb between 2007 and 2009. The Baltic States, Bulgaria, Hungary and Slovenia have the highest ratios but these remain well below the levels in more financially-developed advanced economies. The private credit ratio is far lower for the other emerging European economies but the rate of expansion over 2002 to 2009 has been broadly at the same pace.

In comparative terms, Table 3.6a shows that private credit in the new member states exceeds the level of financial development in emerging Asia and emerging Latin America but the other regions in emerging Europe are broadly similar to these other regions.

[5] In addition to obtaining credit from the domestic banking system, domestic entities can also borrow directly from overseas banks or by issuing bonds domestically or internationally. Table 3.4b shows the extent of cross-border borrowing by non-banks, while Table 3.4k shows the extent of international bond issuance by non-banks. However, in the other direction, some domestic credit might be redirected to other countries. For instance, the local affiliate of a multinational might borrow locally and make an inter-company loan to other units in the global enterprise.

Table 3.6. Private Credit, Percent of GDP

	Country	2002	2007	2009
New Member States	Bulgaria	17	53	84
	Czech Republic	34	43	56
	Estonia	40	84	119
	Hungary	32	57	73
	Latvia	28	82	108
	Lithuania	14	51	75
	Poland	27	35	48
	Romania	8	28	49
	Slovak Republic	37	39	48
	Slovenia	38	69	94
Candidates and Potential Candidates	Albania	6	25	54
	Bosnia and Herzegovina			
	Croatia	44	67	79
	Macedonia, FYR	17	33	51
	Serbia	21	28	35
	Turkey	13	26	36
Eastern Partnership Countries	Armenia	7	10	18
	Georgia	7	22	44
	Moldova	15	30	47
	Ukraine			

Source: Beck et al (2009). Note: Table reports private credit by deposit money banks and other financial institutions.

Table 3.6a. Private Credit, Percent of GDP

	2002	2007	2009
Euro Periphery	99	149	181
Emerging Latin America	30	33	44
Emerging Asia	78	60	53
New Member States	28	54	75
Candidates and Potential Candidates	20	36	51
Eastern Partnership Countries	10	21	36

Source: Beck et al (2009).

The EBRD also reports a private credit measure. In addition, it reports the subcomponent that relates to lending to households and, within household loans, the scale of mortgage loans. These are reported in Table 3.6b. These data show that lending to households outpaced aggregate lending between 2004 and 2007 but the ratio stabilized or even fell slightly between 2007 and 2009 in most cases. In addition, mortgage loans are only important in the Baltic States and, to a lesser degree, in Hungary. In part, the declining share of the corporate sector in credit between 2004 and 2007 may reflect the role played by direct cross-border loans in the corporate sector, which relied less on the domestic banking sector for debt financing (Herzberg 2010).

In Tables 3.7 to 3.9, we look at the sectoral distribution of liabilities for the new member states. Table 3.7 shows that household debt levels grew very quickly between 2002 and 2007 in Hungary, the Baltic States, Bulgaria and Romania. However, this expansion was from quite low levels of household indebtedness in most cases. During the crisis, household debt levels expanded further, especially in Bulgaria and Slovenia. As noted by Herzberg (2010), the household debt levels have to be assessed in the context of relatively-low stocks of household financial assets in emerging Europe, compared to advanced economies.

Tables 3.8 and 3.9 report the sectoral balance sheets for non-financial corporations and financial corporations respectively. The liabilities of the non-financial sector grew rapidly between 2002 and 2007 in the Baltic States, Hungary, Bulgaria and Romania but were much

more stable in Poland and Slovenia. Similar patterns apply for financial corporations. (In both cases, the data refer to aggregate liabilities, which in part will take the form of equity.)

Table 3.6b. Private Sector Credit, Households, Percent of GDP

	Country	Private Credit, % of GDP			Private Credit to Households, % of GDP			Private Credit Household Mortgage, % of GDP		
		2004	2007	2009	2004	2007	2009	2004	2007	2009
New Member States	Bulgaria	35.2	62.8	75.3	10	23	28.2	2.7	10.4	13.5
	Czech Republic									
	Estonia	39.6	86.1		19.7	43.3	52.5	14.6	37.7	46.5
	Hungary	44.3	59.5	66.5	12.8	21.6	26.8	9.5	16.4	21.2
	Latvia	50.3	88.3	103.3	17.6	42.7	47.5	12.4	33.7	36.9
	Lithuania	28.8	60.4	69.8	7.1	24.4	29.2	5.5	17.2	22
	Poland	31	44.6	55.2	10.6	20	28.7	3.8	9.9	15.8
	Romania	15.6	35.6	40.7	4.8	17.7	19.1	0.5	1.4	4.5
	Slovakia	30.4	42.4	51.1	8.6	16.3	22.2	2.9	4.5	6
	Slovenia	48.1	78.8	92.7	12.2	19.2	22.6	2.8	6.2	9
Candidates and	Albania	9.6	30	37.2	2.8	10.6	12.5	1.4		8.5
Potential Candidates	Bosnia and Herzegovina	32.3	44.4	50.2	13.6	26.2	26.3			
	Croatia	51.8	67.1	69.6	30.4	41.1	36.9	10.1	16.4	15.9
	Macedonia, FYR	22.1	36.8	42.9	5.6	13.5			2.6	
	Serbia	24.8	35.3	45	4.9	12.6		0.7	3.8	
	Turkey	17.3	29.5	33.6	4.9	11.6	14.4	0.5	3.9	4.8
Eastern Partnership	Armenia	7	13.6	23.6	2.9	7.1	9.9		1.7	2.7
Countries	Georgia	9.7	27.1		2.8	8.8	10	1	2.6	5.1
	Moldova	0	0	0	0.9	5.5	3.3	1.1	4	3.9
	Ukraine	25.2	58.2	73.3	6.6	22.5	26.4		6.5	14.5

Source: European Bank for Reconstruction and Development.

Finally, Table 3.10 shows the data for the category of "other monetary financial institutions". This group saw a substantial decline in net financial assets (often negative) between 2002 and 2007 but there was a marked deleveraging between 2007 and 2009.

Table 3.7. Household Balance Sheets

		Household, Net Financial Assets, % of GDP			Household Gross Financial Liabilities, % of GDP				Household Gross Loan Liabilities, % of GDP			
	Country	2002	2007	2009	1999	2002	2007	2009	1999	2002	2007	2009
New Member States	Bulgaria	50	84	57		7	26	50		4	23	29
	Czech Republic	53	54	55	18	25	28	35	7	10	25	31
	Estonia	52	62	67	10	18	58	69	7	14	48	58
	Hungary	62	64	64	5	11	50	54	4	11	30	38
	Latvia	34	5	10	2	4	33	42	3	9	48	51
	Lithuania	45	29	39	8	14	33	41	2	3	27	33
	Poland	41	51	43	8	16	25	33	6	13	24	32
	Romania	33	56	47	4	4	26	31	1	2	20	24
	Slovak Republic	39	13	12		21	29	33	5	9	24	34
	Slovenia	67	79	79	9	16	34	48		16	25	29

Source: Eurostat.

Table 3.8. Non-Financial Corporations Balance Sheets

		Non-Financial Corporations, Non-consolidated, Net Financial Assets, %			Non-Financial Corporations Gross Financial Liabilities, % of GDP				Non-Financial Corporations Gross Loan Liabilities, % of GDP			
	Country	2002	2007	2009	1999	2002	2007	2009	1999	2002	2007	2009
New Member States	Bulgaria	-68	-192	-190		171	431	385		42	106	142
	Czech Republic	-89	-96	-86	200	193	219	212	56	42	39	40
	Estonia	-117	-168	-184	224	222	324	365	52	67	108	127
	Hungary	-99	-103	-126	119	145	173	191	46	58	92	127
	Latvia	-83	-82	-95	135	130	179	188	27	45	79	96
	Lithuania	-84	-97	-107	212	248	351	412	27	26	55	55
	Poland	-71	-78	-81	143	153	162	152	28	33	31	35
	Romania	-82	-123	-121	216	161	246	276	31	30	43	58
	Slovak Republic	-45	-54	-45		205	254	247	39	23	25	30
	Slovenia	-92	-123	-118	156	136	139	138		50	79	95

Source: Eurostat.

Table 3.9. Financial Corporations Balance Sheets

		Financial Corporations, Net Financial Assets, % of GDP			Financial Corporations Gross Financial Liabilities, % of GDP				Financial Corporations Gross Loan Liabilities, % of GDP			
	Country	2002	2007	2009	1999	2002	2007	2009	1999	2002	2007	2009
New Member States	Bulgaria	3	-36	14		85	205	175		9	19	17
	Czech Republic	0	-3	0	170	163	168	173	5	12	9	8
	Estonia	-17	0	7	109	147	203	221	31	33	29	24
	Hungary	-2	-7	2	70	102	190	213	11	13	26	35
	Latvia	-3	-2	8	43	55	127	136	6	9	56	79
	Lithuania	-1	-1	2	136	116	178	214	5	8	13	11
	Poland	16	-14	-3	82	84	138	141	5	5	8	13
	Romania	0	-3	8	50	49	101	104	3	3	12	22
	Slovak Republic	-19	2	8		136	197	221	15	13	36	35
	Slovenia	8	4	3	118	148	149	152		17	47	52

Source: Eurostat.

Table 3.10. Other Financial Corporations Balance Sheets

		Other Monetary Financial Institutions, Net Financial Assets, % of GDP			Other Monetary Financial Institutions Gross Financial Liabilities, % of GDP				Other Monetary Financial Institutions Gross Loan Liabilities, % of GDP			
	Country	2002	2007	2009	1999	2002	2007	2009	1999	2002	2007	2009
New Member States	Bulgaria	3	-31	-7		40	131	111		1	8	12
	Czech Republic	4	-1		112	96	106		0	4	3	
	Estonia	-10	0	5	61	80	134	150	8	7	5	5
	Hungary	-1	-6	1	69	70	117	136	7	8	6	21
	Latvia	-2	-1	10	48	77	145	151	4	4	39	61
	Lithuania	-1	-2	1	27	32	84	96	3	4	0	0
	Poland	9	-11		56	56	79		3	3	6	
	Romania	-3	-1	7	32	31	63	63	2	1	7	10
	Slovak Republic	-18	12	37	79	81	66	46	10	4	9	10
	Slovenia	3	3	4		82	123	146		9	30	33

Source: Eurostat.

Finding 3.2: Domestic Exposures

- Public debt is still comparatively low in most countries, although Hungary (and possibly Albania) are important exceptions.
- The rapid growth in private credit poses the risk of non-performing loans in some countries.
- The sectoral balance sheet data show that households, corporates and banks have increased the size of their balance sheets but these remain relatively small compared to advanced economies.

4. Debt Overhang at the Firm, Household and Bank Level

4.1 Debt Overhang in the Enterprise Sector

In this section we examine the level and currency structure of bank credit among firms in Emerging Europe. Relating firm debt to aggregate contraction in GDP, export volume as well as to currency depreciation we assess in which countries firms are more likely to face debt overhang due to excessive leverage and unhedged foreign currency borrowing.

The Use of Bank Credit

The main data source of our analysis is the *Business Environment and Enterprise Performance Survey* (*BEEPS*). The European Bank for Reconstruction and Development (EBRD) and the World Bank jointly conducted this survey in 1999, 2002, 2005, and 2009.[6] Our analysis is based on the 2009 wave of the survey, which was carried out at the onset of the financial crisis (October 2008 – April 2009). BEEPS 2009 provides data on 9,098 firms from the 21 ECA countries covered in this background paper. The sample provides a representative sample of firms for each of these countries.[7] By contrast, databases that offer financial statement information, such as Worldscope or Amadeus, typically cover only the larger, formal enterprises in the region.

We use three indicators of the use of bank credit by firms. Our first indicator *Bank loan* is a dummy variable measuring whether the firm had a bank loan or credit line at the time of the survey (end of 2008, beginning of 2009). Likewise the indicator *Overdraft* is a dummy variable measuring whether the firm had access to an overdraft facility at the time of the survey. Finally, the indicator *Leverage* captures the share of assets purchased in 2007 that were financed with bank credit (only measured for those firms which actually purchased assets in 2007). Table 4.1 provides an overview of these three indicators of bank finance by country, whereby we distinguish between EU 10 countries, (potential) EU candidate countries and EU neighborhood countries. The table shows that half of the firms in Emerging Europe use bank loans or an overdraft facility, while on average only one-quarter of recent firm investment is financed through a bank loan. The use of bank credit differs strongly across regions. In the EU member

[6] With BEEPS Brown et al. (2011a), and Popov and Udell (2010) analyse credit availability, Gorodnichenko and Schnitzer (2010) analyse financial constraints and firm innovation, while Ranciere et al. (2010) focus on the impact of currency mismatch on firm performance.

[7] The survey covers all 29 countries in which the EBRD is operational, with the exception of Turkmenistan. See http://www.ebrd.com/country/sector/econo/surveys/beeps.htm for detailed information on BEEPS 2009.

countries 49% of the firms have a bank loan, while 26% of recent investment is through banks. Surprisingly, the use of external finance is higher in the candidate countries, where 60% of the firms have a bank loan. Firm leverage seems to be the lowest in the EU neighborhood countries where only 39 percent of the firms have a bank loan.

Is the leverage of firms in Emerging Europe particularly low compared to firms in more advanced European economies? Recent evidence suggests that the use of bank finance is actually quite similar in emerging and advanced Europe. Using data from the 2005 wave of BEEPS, Brown et al. (2011a) show that the share of firms which have a loan in Emerging Europe is only slightly lower than in a selection of Western European countries (Ireland, Portugal, Spain, Greece, Germany).

Table 4.1. Enterprise Credit by Country

	Bank loan (%)	Overdraft (%)	Leverage
EU members	*49*	*42*	*26*
Bulgaria	39	28	28
Czech Rep	48	58	17
Estonia	50	41	23
Hungary	42	47	33
Latvia	48	19	28
Lithuania	52	13	31
Poland	50	52	23
Romania	43	44	21
Slovak Rep	43	53	21
Slovenia	74	64	34
EU (potential) candidates	*61*	*60*	*28*
Albania	49	84	15
Bosnia	65	51	27
Croatia	66	67	33
Macedonia	62	21	29
Serbia	67	66	29
Turkey	56	68	38
EU neighborhood	*39*	*37*	*22*
Armenia	43	44	21
Georgia	41	35	26
Moldova	40	26	21
Ukraine	32	44	18
Total	**50**	**46**	**25**

Source: BEEPS survey and authors' calculation. Note: This table reports means for each indicator of credit use by country. Observations are weighted to account for stratification of the sample with respect to industry (manufacturing, retail and other services) as well as frim size. Bank loan is 1 if the firm currently has a loan or a credit line from a bank and 0 otherwise. Overdraft is 1 if the firm currently has an overdraft facility from a bank and 0 otherwise. Leverage is the share of firm investment in 2007 which was financed by bank credit.

Which types of firms in Emerging Europe are indebted to banks? Panel A of Table 4.2 shows that the **incidence of bank credit** is related to firm size, financial transparency and economic activity. In line with existing evidence on information asymmetries and credit access (see e.g. Brown et al. 2009), small firms (those which have less than 50 employees), young firms (less than 15 years old) and firms which are not financially transparent (i.e. do not have their accounts audited) are less likely to have bank credit. Firms with export activities are also much more likely to have bank credit than firms which sell purely to their domestic market. The effects of firm size, financial transparency and export orientation are also economically important: Roughly 60% of large, audited and exporting firms have bank credit, while only 40% of small, non-audited or non-exporting firms do so. By contrast, firm age, sector of activity

(manufacturing vs. services) and ownership (private, state, or foreign) seem to have less influence on the use of bank credit.

Table 4.2. Firm Characteristics and Use of Bank Credit

Panel A. Incidence of bank credit

This panel reports means for *Bank loan* and *Overdraft* for the subsample of firms which have and don't have a specific firm characteristic. The sample tests report the results of linear independent tests which examine whether credit incidence differs for firms with and without each firm characteristic. ***, **, * denote significance at the 0.01, 0.05 and 0.10-level.

		Share of firms (%)	Bank loan		Overdraft	
Small firm	yes	74	0.40		0.44	
	no	26	0.60	***	0.61	***
Young firm	yes	62	0.42		0.47	
	no	38	0.48	***	0.52	***
Audited	yes	44	0.55		0.55	
	no	56	0.38	***	0.43	***
Manufacturing	yes	34	0.49		0.45	
	no	66	0.42	***	0.53	***
Exporter	yes	26	0.58		0.60	
	no	74	0.41	***	0.44	***
State owned	yes	5	0.47		0.49	
	no	95	0.44		0.47	
Foreign owned	yes	1	0.40		0.64	
	no	99	0.44		0.47	*

Panel B. Leverage

This panel reports the distribution of the variable *Investment loan* for subsamples of firms which have and do not have a specific firm characteristic. Chi-square tests report whether the distribution is significantly different for firms with and without each firm characteristic. ***, **, * denote significance at the 0.01, 0.05 and 0.10-level.

			Investment share financed by loan				
		no investment	0%	1% - 33%	34% - 67%	67%-100%	Chi2 test
All firms		40	34	7	8	11	
Small firm	yes	48	32	5	6	10	
	no	28	38	9	11	14	***
Young firm	yes	42	34	6	7	11	
	no	36	35	8	8	12	***
Audited	yes	32	36	8	10	14	
	no	46	34	6	5	9	***
Manufacturing	yes	40	34	7	7	11	
	no	40	35	7	8	11	
Exporter	yes	30	36	8	11	15	
	no	45	34	6	6	10	***
State owned	yes	27	49	6	8	10	
	no	41	33	7	8	11	***
Foreign owned	yes	42	35	8	8	8	
	no	40	34	7	8	11	

Source: BEEPS survey and authors' calculation. Note: The firm characteristics are defined as follows: *Small firm* is 1 if the firm has less than 50 employees, and 0 otherwise. *Young firm* is 1 f the firm is less than 15 years old and 0 otherwise. *Audited* is 1 if the firm has its accounts audited, and 0 otherwise. *Manufacturing* is 1 if the firm operates mainly in the Manufacturing sector, and 0 otherwise. *Exporter* is 1 if the firm yields revenue from cross-border sales, an 0 otherwise. *State owned* is 1 if the government has majority ownership of the firm, and 0 otherwise. *Foreign owned* is 1 if a foreign company has majority ownership of the firm, and 0 otherwise. All means are adjusted for sample weighting in the BEEPS 2009 survey.

Panel B of Table 4.2 provides an overview of the **leverage of firms** with regard to their recent investment. The table displays the share of firms which are not leveraged at all, as they

either did not invest or financed their recent investment without bank credit. It further displays the share of firms with a low (1-33%), moderate (34-67%), and high (67-100%) level of bank financing for their most recent investment. The table shows that 74% of all firms are not leveraged, either because they did not invest (40%) or invested without using bank finance (34%). Those firms which did use bank finance to invest are equally divided between low debt levels (7%) moderate debt levels (8%) and high debt levels (11%). In line with our findings on the incidence of bank credit we find that leverage is substantially higher among large, audited and export orientated firms. Roughly 25% of large, audited and exporting firms have moderate to high leverage levels, while only 15% of small, non-audited or non-exporting firms do so. Again, firm age, sector of activity and ownership seem to have little effect on leverage.

The data presented above suggest that "excessive leverage" in the region may be more widespread than recent research using financial statement data for large firms suggests. Coricelli et al. (2009) examine balance sheet and income statement data for roughly 8,000 manufacturing firms from 12 countries in Emerging Europe over the period 2001-2005. Their study aims to establish the threshold of firm leverage above which external finance reduces firm productivity. Their results suggest that on average the optimal debt level for firms in the region is around 40%. They find that the share of firms with leverage exceeding this level ranges from less than 5% in Slovenia, Slovakia and Hungary to more than 15% in Bulgaria, Latvia and Russia. The BEEPS data presented above suggest that among a representative sample of firms in the region nearly 20% display excessive leverage levels (according to the Corrichelli et al. 2009 threshold).

What does this imply for the threat of **debt overhang** in the region? The theory of debt overhang suggests that high levels of existing debt will affect the future operations and investment of those firms that have been hit by a negative shock (Myers 1977). For these firms, the returns from positive NPV projects in the future may be partly go towards paying off existing obligations, and therefore may not be undertaken. Whether or not Emerging Europe faces a debt overhang among firms, depends therefore on whether those firms which are highly leveraged are those which were also strongly hit by the recent crisis. In Figure 4.1 we examine whether this is the case. Figure 4.1.a plots the share of firms with moderate or high leverage in 2008/2009 (exceeding 33% of recent investment) per country against GDP growth per country in 2009. This figure suggests that four countries in the region may indeed suffer from debt overhang. The Baltic states Latvia, Lithuania and Estonia all have more than 25% of highly leveraged firms and with a GDP contraction of 14%-18% in 2009 were among the most severely hit economies in the crises. In addition, Slovenia and Croatia have shares of highly leveraged firms exceeding 30% and at the same time experienced contractions of more than 5% of GDP in 2009. At the other end of the scale, countries such as Poland and Albania have few highly leveraged firms and experienced mild GDP contractions during the crisis.

Given the dramatic decline in export income to the region in 2009 and 2010 and the high leverage levels among exporting firms (see Table 4.2), the **tradable sector** may be most prone to debt overhang. Figure 4.1.b examines for which countries debt overhang in the tradable sector may be a particular issue. The figure plots the share of moderately and highly leveraged firms within the tradable sector against the aggregate decline in export volume in 2009. Latvia, Lithuania Estonia, as well as Macedonia and Slovenia are most likely to be affected by debt overhang in the tradable sector: In each of these countries. more than a third of the exporting firms are highly leveraged, and these countries experienced substantial contractions in export

volume (more than 20%) in 2009. Debt overhang in the tradable sector seems, however, to be an issue for a broader set of countries as well: In Bosnia, Turkey, the Slovak Republic, Serbia, the Czech Republic and Croatia more than a quarter of the export-orientated firms are highly leveraged and all of these countries also experienced huge negative shocks to their tradable sector.

Foreign Currency Lending

Foreign currency (FX) borrowing is seen as a major threat to financial stability in Emerging Europe. More than 70 percent of all private sector loans in Estonia, Latvia, and Serbia are currently denominated in (or linked to) a foreign currency. The share of FX loans also exceeds that of domestic currency loans in Bulgaria, Hungary, and Romania (EBRD, 2010). With regard to debt overhang, foreign currency borrowing is a key potential driver among firms in the region. The substantial depreciation of several currencies before and during the financial crisis imply that those firms which have taken unhedged FX loans now face a substantially higher debt burden, which may constrain their operations and investment going forward. Whether or not FX lending may seriously curb the economic activity of firms in the region depends on the answers to two questions: (1) What share of the firms in the region hold unhedged foreign currency loans? and (2) Are firms with unhedged FX loans predominantly located in those countries where sharp depreciations have taken place?

Several studies using aggregate cross-country data have suggested that FX borrowing is predominantly driven by retail customers taking unhedged currency bets. Luca and Petrova (2008) show that the share of FX loans is higher in countries with higher interest rate differentials. This finding has been supported by Basso et al. (2010) or for example by Rosenberg and Tirpak (2010). Recent firm-level evidence suggests that FX borrowing in the region is not driven predominantly by unhedged customers taking currency bets to benefit from interest rate differentials. Examining the 2005 wave of BEEPS, Brown et al. (2011b) show that only 25% of the loans taken by firms in the ECA region are actually denominated in foreign currency.[8] Importantly, their evidence suggests that those firms which take FX loans are more likely to be hedged against exchange rate risks: FX borrowers are more likely to have export activities, sales to multinational firms or foreign owners than firms which borrow in local currency. This cross-country evidence is backed up loan-level evidence for Bulgaria (Brown et al. 2010) which shows that less risky clients are more likely to apply for and receive an FX loan. At the macroeconomic level both studies suggest that FX borrowing by firms in the region is hardly driven by currency bets: Changes in interest rate differentials over time seem to have little effect on the share of FX loans taken by firms within a country. Indeed, Brown et al. (2011b) find that changes in interest rates over time affects the frequency of FX borrowing in only two countries; Hungary and Serbia.

While FX lending by firms in the region may not be primarily driven by carry-trade behavior, Brown et al. (2011b) point to a non-negligible share of unhedged FX loans in the region. Their analysis suggests that 43% of all FX borrowers in the ECA region do not have

[8] Evidence from Brown et al. (2010) suggests that the share of FX loans to firms did not further increase in the run up to the crisis. For example, while there was a significant increase in credit volume in Bulgaria between 2005 and 2007, their data shows that the share of FX loans to firms actually decreased from 37.6% to 33.6%.

foreign currency income, and thus that roughly 11% of all loans in the region are unhedged FX loans.[9]

Figure 4.1 Firm Debt and Crisis Impact by Country

Figure a. Excess leverage and GDP contraction by country

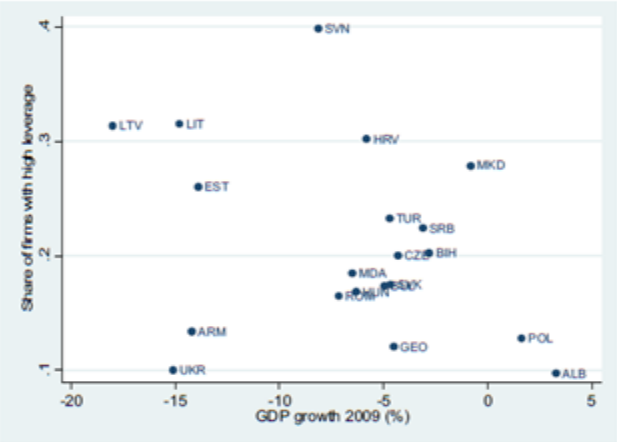


Figure b. Excess leverage and contraction in the tradable sector

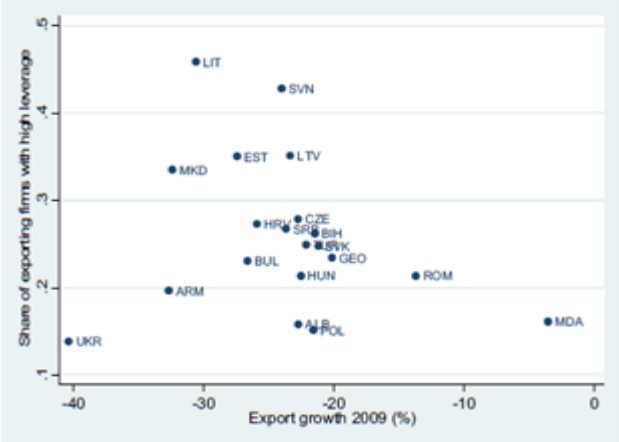
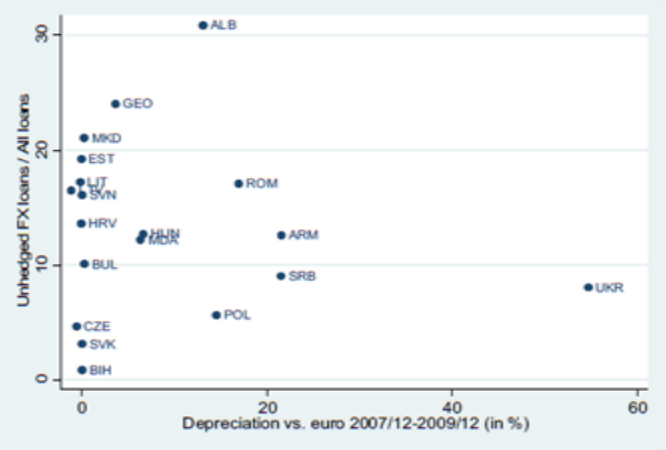


Figure c. Unhedged FX loans and Depreciation



Source: BEEPS survey and authors' calculation. Note: Figure a plots the share of highly leveraged firms (leverage exceeding 33%) per country against the GDP growth in 2009. Figure b plots the share of highly leveraged exporting firms (leverage exceeding 33%) per country against the Export volume growth in 2009. Figure c plots the share of unhedged FX loans as a percentage of total loans against the 2007-2009 depreciation of the local currency vis a vis the euro. GDP growth, export volume growth and exchange rates are taken from the EBRD transition report. Undhedged FX loans are calculated from Brown Ongena and Yesin (2011) which uses 2005 BEEPS data.

Figure 4.1.c plots the share of unhedged loans by country from Brown et al. (2011b) against the cumulative depreciation per country against the euro in 2008 and 2009. The figure shows that those countries with the highest shares of unhedged FX lending experienced the smallest depreciations vis a vis the euro during the financial crisis. Albania, with a depreciation of more than 15% and more than 30% of unhedged FX loans, seems most likely to be affected by

[9] As noted above, according to he BEEPS 2005 data 25% of all loans to firms in the ECA region are FX loans. Among these FX loans 43% are to firms which have neither export income, sales to multinational companies or foreign ownership.

debt overhang induced by unhedged FX borrowing. By contrast, Ukraine which experienced the sharpest depreciation in the crisis (minus 55%) is unlikely to be affected, due to low levels of unhedged FX loans (8%). All in all, figure 4.1.c suggests that increases in the debt burden of FX borrowers due to exchange rate depreciations can hardly be viewed as a key driver of debt overhang in the region.

Finding 4.1: Debt Overhang in the Enterprise Sector

- Based on a comparison of the share of highly leveraged firms and GDP contraction during the crisis, debt overhang is likely to pose a general threat to firm activity in only a limited number of the more advanced countries: Latvia, Lithuania, Estonia, and Slovenia.
- Leverage levels among export-orientated firms and the widespread contraction of export income in the region suggest that debt overhang in the tradable sector may be an issue for a broader set of countries: Latvia, Lithuania Estonia, Slovenia, Macedonia, Bosnia, Turkey, the Slovak Republic, Serbia, the Czech Republic and Croatia.
- Despite sharp depreciations in many countries during the crisis, unhedged foreign currency borrowing by firms does not seem to be a source of debt overhang. The countries with a high incidence of unhedged FX loans experienced only minor depreciations during the crisis.

4.2 Debt Overhang in the Household Sector

In this section we assess potential for debt overhang in the household sector, i.e. the extent to which built up consumer and mortgage debt may curb future household consumption and investment. We use recent survey data to examine the incidence and distribution of household debt across the region as well as how household debt is correlated to the impact of the crisis at the household level.

Household Debt towards Banks

Our analysis is based on the 2010 wave of the EBRD-World Bank Life in Transition Survey (LITS).[10] Within this survey at least 1,000 interviews were conducted with randomly selected households in each country. In the 21 countries covered by this report a total of more than 23,525 households were interviewed. The LITS questionnaire gathers information on household composition, housing, and expenses, as well as the current and past economic activity of the respondent. Importantly for our purpose, the 2010 wave of the survey elicits information on the incidence and type of bank debt in the household. Households which own their dwelling are asked whether they have a mortgage. If they do have a mortgage they are asked about the type of mortgage they have, in particular whether it is denominated in local or foreign currency. Further households are asked whether any member of the household has a debit or credit card. The LITS dataset includes sampling weights to account for the differences in the ratio of sample size to population size across countries, as well as for sampling biases within countries. The data

[10] We thank the EBRD for advanced access to the LITS 2010 survey data.

thus allow us to provide a representative analysis of the incidence and distribution of household debt by country.[11]

Table 4.3 displays the use of credit card and mortgage debt for households as well as the currency structure of mortgage debt by country. The table suggests that only a minor share (6%) of all households in the region which own their dwelling have mortgage debt. Moreover, only one-third of these mortgages are denominated in foreign currency, implying that only 2% of the owner-occupier households in the region have a foreign currency mortgage. Consumer credit via credit cards is used by a much larger share of the population (26%). Household use of bank credit differs strongly across the region: In the EU member countries 9% of households have a mortgage while this is the case for only 4% of households in candidate countries and 2% of households in EU neighborhood countries. Credit card use is also much less prominent in neighborhood countries (10%) than in either EU members (30%) or candidate countries (30%). Even within the EU member countries there are large differences in household use of credit. In Hungary 16% of all owner-occupier households have a mortgage, and 55 % of all households have a credit card. By contrast in Lithuania only 6% of households have a mortgage and 12% a credit card.

Table 4.3. Household Use of Credit by Country

	Credit Card	Mortgage (%)	FX mortgage (%)
EU members	*31*	*9*	*4*
Bulgaria	15	4	1
Czech Rep	41	11	0
Estonia	31	17	9
Hungary	55	16	9
Latvia	34	9	7
Lithuania	12	6	2
Poland	19	4	2
Romania	13	5	3
Slovak Rep	41	13	0
Slovenia	47	4	4
EU (potential) candidates	*30*	*4*	*2*
Albania	18	2	1
Bosnia	15	4	1
Croatia	37	7	6
Macedonia	33	2	0
Serbia	21	4	3
Turkey	58	3	0
EU neighborhood	*10*	*2*	*1*
Armenia	9	4	1
Georgia	7	2	1
Moldova	2	1	0
Ukraine	21	1	1
Mean	**26**	**6**	**2**

Source: LITS survey and authors' calculation. Note: This table reports means for each variable by country. Observations are weighted to account for the varying size of the sampling units within countries. Credit Card is 1 if any member of the household has a credit card and 0 otherwise. Mortgage is 1 if the household owns its dwelling and currently has a mortgage and 0 if it owns its dwelling but has no mortgage. FX Mortgage is 1 if the household owns its dwelling and currently has a foreign currency mortgage and 0 if it owns its dwelling but has no FX mortgage.

[11] See Beck and Brown (2010) for a detailed discussion of the LITS survey. Information on the 2006 survey is available from: http://www.ebrd.com/pages/research/economics/data/lits.shtml

Household leverage is substantially lower in Emerging Europe than in more advanced European countries. The 2010 LITS survey provides comparable data for five advanced European economies: France, Germany, the UK, Sweden, and Italy. In these countries 40% the households which own their home have a mortgage compared to just 6% in Emerging Europe. Also, 53% of households in advanced Europe have a credit card compared to 26% in Emerging Europe.

The limited use of bank credit in Emerging Europe suggests that debt overhang in the household sector should not be a major impediment to overall future economic growth in the region. To assess whether household debt may limit economic activity in selected countries, we need to examine which type of households use bank debt and how debt affects their consumption and investment. Further, we need to look in more detail at whether household debt is more prevalent in countries that were the most severely hit by the crisis.

The Distribution of Debt across Households

Consumer credit and mortgages in the region seem to be concentrated among those households which are least vulnerable to economic shocks. Table 4.4 examines the distribution of credit cards, mortgages and FX mortgages across household types. We focus on three household characteristics which should capture their resilience to economic shocks: the income level of the household, whether the household depends on wage income or is self employed, and the education level of the household. The table suggests that households with a mortgage or a credit card are substantially more wealthy. For example households with a mortgage have an average income of more than 5,700 USD per year, while households without a mortgage have an average income level of just around 4,000 USD. Households with a credit card or mortgage are also much more likely to have a household member with higher education. We find that self-employed households are not more likely to be indebted than households with wage income, which confirms that the more risky (self-employed) households are not more exposed to bank debt.

Table 4.4. Household Characteristics and Use of Credit

	All households (n=23'525)							Households with mortgage (n=1'114)		
		Credit card			Mortgage			FX mortgage		
	Full sample	yes	no	Sample test	yes	no	Sample test	yes	no	Sample test
Income (USD)	4,107	5,702	3,559	***	5,744	3,957	***	6,219	5,381	**
Self employed (1=yes)	0.13	0.13	0.13		0.14	0.14		0.11	0.17	***
University degree (1=yes)	0.19	0.25	0.16	***	0.30	0.18	***	0.34	0.27	**

Source: LITS survey and authors' calculation. Note: The table reports means for each household characteristic by credit status. The credit status variables are as defined in Table 3.3.1. The household characteristics are defined as follows: Urban is 1 if the household is located in an urban area and 0 if it is located in a rural area. Income is the OECD equivalized expenses in USD per year. Self employed is 1 if the household derives its income predominantly from self-employment or farming and 0 otherwise. University degree is one of the respondent has a university degree and 0 otherwise. All means are adjusted for sample weighting in the LITS 2010 survey. The sample tests reports the results of linear independent sample tests which examine whether household characteristics differ for households with and without a specific credit status. ***, **, * denote significance at the 0.01, 0.05 and 0.10-level.

Table 4.4 suggests that among the households with mortgage debt, households with a foreign currency mortgage are less vulnerable to economic shocks than those which have a local currency mortgage. Households with an FX mortgage have higher income and are better educate. It is particularly reassuring that self-employed households seem to be less likely to take on a FX mortgage than households with wage earnings.

These findings partly confirm recent evidence by Fidurmuc et al. (2011) on intended borrowing in central Europe. They examine household survey data from the EURO Survey, conducted by the Austrian Central Bank (OeNB). This survey has been conducted in 10 countries of Eastern Europe on a half-yearly basis since 2007 and elicits information on household perceptions of economic conditions (e.g. exchange rates), their current financial portfolios and their intentions to borrow in the near future. They show that among the households which intend to take a new loan, those which are younger, better educated, have with savings in euro, and have remittance income are more likely to take a foreign currency loan. In contrast to the data presented above, however, they find that richer households are not more likely to demand FX loans.

Household Debt and Crisis Impact

Does the fact that credit cards and mortgages are held by the least vulnerable households imply that debt has had a negligible effect on household consumption and investment in the crisis? The recently conducted LITS 2010 survey allows us to assess the impact of household debt on household consumption and investment. In this survey households were asked whether during the crisis they reduced their consumption of goods (food, luxury goods alcoholic drinks), cut the use of services (phone, utilities, health insurance) or sold off some of their assets. In Table 4.5 we relate the consumption and investment behavior of households in the crisis to their use of bank debt (Credit card, Mortgage). We hereby control for household income, education and employment type. The LITS survey also allows us to control for a range of economic shocks which may have hit the household during the crisis: job loss, income reduction, closing of a family business, or a reduction in remittance flows to the household.

The multivariate analysis presented in Table 4.5 suggests that those households with mortgage debt were more likely to reduce their consumption and investment during the crisis. Households with a mortgage were 3% more likely to reduce their consumption of goods and 8% more likely to cut their use of services and 2% more likely to sell assets. By comparison a job loss by a household member increases the probability of reduced consumption, cut services, and asset sales by 8%, 13% and 2% respectively. Thus at roughly half the impact of the effect of income shocks, the impact of mortgage debt on consumption and investment are sizeable from an economic point of view. Interestingly, we find no impact of credit card use on household consumption or investment. This suggests that many credit card holders may not use them to incur substantial debt.

In line with our analysis for foreign currency firm debt, FX mortgages do not seem to be a source of debt overhang in the household sector. Figure 4.2.b plots the incidence of FX mortgages per country against the depreciation of the local currency against the euro in 2008 and 2009. The figure shows clearly that those countries with the highest incidence of FX mortgages

experienced the smallest depreciation in the crisis. Again, we cannot pick out a single country which experienced a severe depreciation and has a significant share of FX mortgages.

Table 4.5. Household Use of Credit and Crisis Impact

Dependant variable	*Cut consumption*	*Cut services*	*Sold assets*
Model	(1)	(2)	(3)
Credit card	0.014	0.018	0.005
	[0.0126]	[0.0146]	[0.00460]
Mortgage	0.0305***	0.0828***	0.0170*
	[0.0118]	[0.0186]	[0.00898]
Job loss	0.0738***	0.129***	0.0173***
	[0.0157]	[0.0139]	[0.00599]
Closed business	0.017	-0.016	0.005
	[0.0197]	[0.0186]	[0.00412]
Wage reduction	0.0857***	0.0786***	0.003
	[0.00928]	[0.00989]	[0.00331]
Less remittance	0.0349**	0.0806***	0.0172***
	[0.0173]	[0.0169]	[0.00654]
Income	0.001	-0.0273***	-0.001
	[0.00998]	[0.0105]	[0.00244]
Self employed	-0.006	0.020	0.006
	[0.0158]	[0.0137]	[0.00528]
University degree	-0.0382***	-0.0559***	-0.002
	[0.0130]	[0.0126]	[0.00409]
Method	Probit	Probit	Probit
Pseudo R2	0.08	0.08	0.05
Country fixed effects	yes	yes	yes
# Households	13,838	13,838	13,838
# countries	21	21	21

Source: LITS survey and authors' calculation. Note: The dependent variables in this table are Cut consumption, Cut services and Sold assets. Cut consumption is 1 if the household reduced its consumption of goods in 2009 or 2010 and 0 otherwise. Cut services is 1 if the household reduced its use of health, utilities or telecommunication services in 2009 or 2010 and 0 otherwise. Sold assets is 1 if the household sold off an asset in 2009 or 2010 and 0 otherwise. The variable Job loss is 1 if any household member lost his job since 2008, and 0 otherwise. Closed business is 1 if a family business was closed since 2008, and 0 otherwise. Wage reduction is 1 if a family member's wage income was reduced since 2008, and 0 otherwise. Less remittance is 1 if remittances from abroad to the family were reduced since 2008, and 0 otherwise. All other variables are as defined in tables 3.3.1 and 3.3.2. All models report marginal effects of profit estimations and include country fixed effects. Observations are weighted according to sample weighting in the LITS survey. Standard errors are reported in brackets and are adjusted for clustering at the country level. ***, **, * denote significance at the 0.01, 0.05 and 0.10-level.

Our analysis above suggests that debt overhang in Eastern Europe is a concentrated phenomenon: Few households have mortgage debt. But those households that do have mortgage debt have reduced their consumption and investment substantially. Which countries are most likely to suffer from such mortgage debt overhang? Figure 4.2.a plots the change in GDP per country in 2009 against the share of households with mortgage debt. The figure suggests that mortgage debt overhang is hardly an issue in the region. Estonia is the only country which experienced a sharp contraction in GDP in 2009 and boasts a high incidence of mortgage credit (17%).

As mentioned above the use of credit cards seems to have had little impact on household consumption and investment during the crisis. Thus it is questionable whether the high levels of credit card use actually influence economic activity. Figure 4.2.c plots the change in GDP per country in 2009 against the incidence of credit card use. The figure suggests that Estonia, Latvia and Ukraine are most likely to be affected by consumer credit. These countries experienced

GDP contractions 2009 and all have a large share of households which use credit cards (more than 20%).

Figure 4.2. Household Debt and Crisis Impact by Country

Figure a. Incidence of mortgages and change in GDP by country

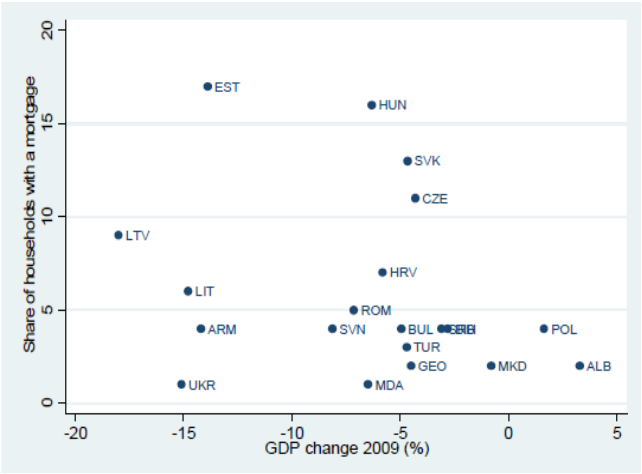


Figure b. FX mortgages and Depreciation

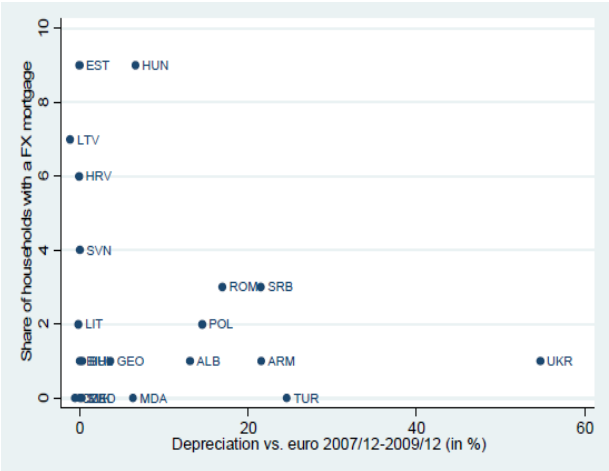
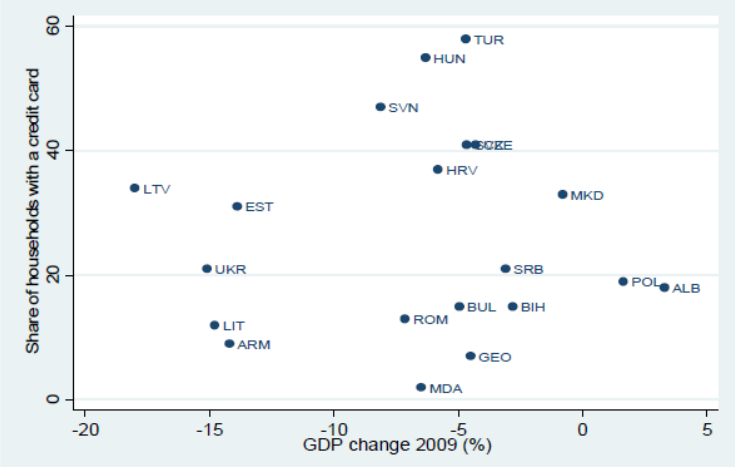


Figure c. Use of credit cards and change in GDP growth by country



Source: LITS survey and authors' calculation. Note: Figure a plots the share of households with a mortgage per country against GDP growth in 2009. Figure b plots the share of Households with an FX mortgage against the 2007-2009 depreciation of the local currency vis a vis the euro. Figure c plots the share of households with a credit card per country against GDP growth in 2009. GDP growth and exchange rates are taken from the EBRD transition report.

Finding 4.2: Debt Overhang in the Household Sector

- Mortgage debt seems to have had a significant adverse impact on household consumption and investment during the crisis. However, due to the low incidence of mortgage debt in the region hardly any country, except Estonia, seems to face a threat of debt overhang.

- The use of credit cards is much more widespread in the region than mortgage debt. However, credit card use has had a negligible effect on household income and investment during the crisis. It is unlikely therefore that credit card debt may jeopardize future economic activity in the region.
- FX mortgages hardly pose a threat to future household consumption and investment. Only a minor fraction of households in the region are exposed to foreign currency mortgages. Moreover those countries in which FX mortgages are most prevalent did not experience major exchange rate shocks during the crisis.

4.3 Debt Overhang in the Banking Sector

In this section we turn to the supply side of credit and examine which countries' banks are more likely to face debt overhang problems and which customer group might be more affected from these. First, we relate the quality of banks' loan portfolios to their profitability and their lending activities. Second, we review the literature on foreign banks' lending behavior during the crisis to assess whether they have contributed to the transmission of a shock that evolved unrelated to the local economic environment.

Non-Performing Loans

Throughout the transition region non-performing loan (NPL) ratios increased substantially in 2009. Figure 4.3 illustrates the increase in NPL ratios between 2007 and 2009 by country and relates to bank performance and bank lending structure. NPL ratios in Ukraine increased by nearly 50 percentage points in just two years, while banks in Georgia, Lithuania, Latvia and Moldova also experienced NPL increases of more than 10 percentage points.

The very high level of the NPL ratio in Ukraine compared to the Baltic countries, which also experienced substantial economic contraction during the crisis, has been attributed to the large exchange rate depreciation in Ukraine and a subsequent rise in defaults on FX loans (see De Haas and Knobloch (2010)). The household-level and firm-level survey data presented in sections 4.1 and 4.2 cast doubt on this exchange rate explanation: Only 51% of household loans in Ukraine are denominated in FX, while a mere 8% of the loans extended to firms in Ukraine are unhedged FX loans. At the aggregate level corporate (household) loans account for 60% (40%) of all bank loans in Ukraine, suggesting that in total roughly one-quarter of all bank loans in the country are denominated in FX[12]. Moreover, the LITS data suggest that in Ukraine only 16% of household mortgages denominated in FX were in default in 2010. Income shocks as well as a drop in house prices are thus more likely to have spurred the strong increase in non-performing loans.

How well banks are able to cope with the credit losses they accumulated during the crisis should depend on their profitability. Figure 4.3.a relates the increase in NPL ratios between 2007 and 2009 to pre-crisis profitability of banks, measured by the 2005-2007 average return on assets (ROA) of banks in that country. The figure shows that, besides Moldova, those countries facing the highest increase NPL ratios did not have particularly profitable banks in the pre-crisis

[12] See EBRD Transition Report 2010.

period. The average ROA of banks in Ukraine, Lithuania and Latvia for example were between 1% and 2%: Such levels of profitability are well within the norm for banks, given the high leverage in the sector. However, they are small compared to the significant loan losses incurred in the crisis.

Figure 4.3. Non Performing Loans (NPL) Country

Figure a. NPL increases and prior bank profitability

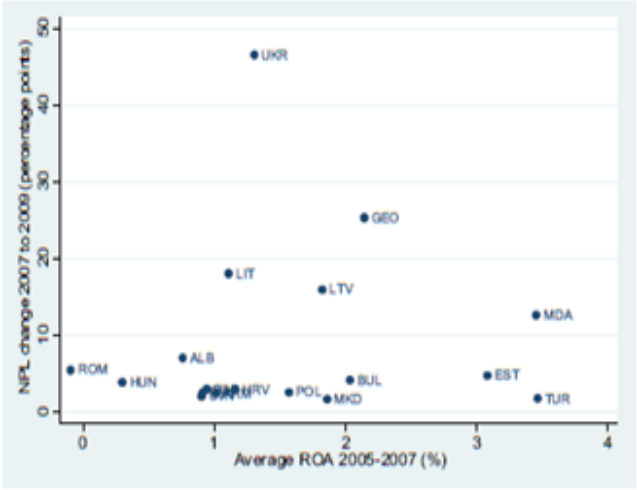


Figure b. Severity of NPL problem and firm lending

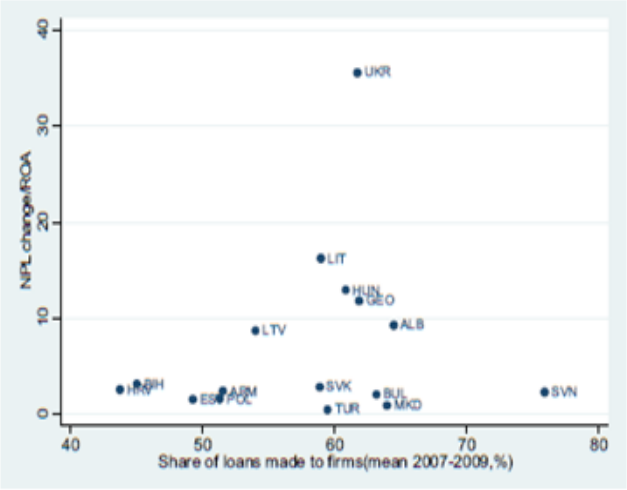
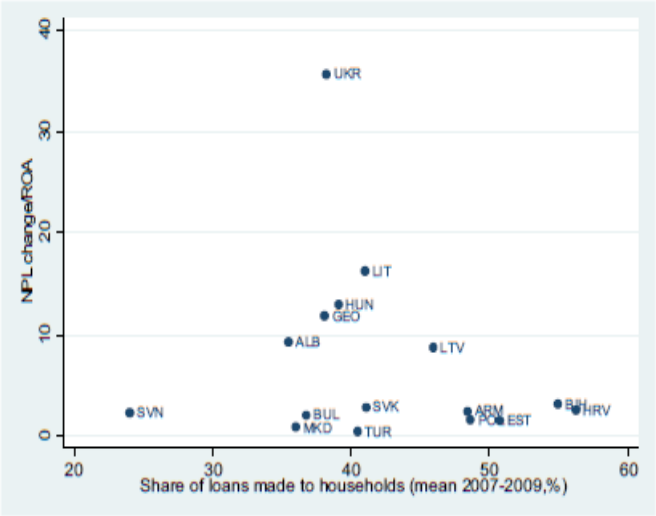


Figure c. Severity of NPL problem and household lending



Note: Figure a plots the aggregate change in non performing loan (ΔNPL) ratios by country between 2007 and 2009 (in percentage points) against the 2005-2007 average return on assets (ROA) of banks in the same country. Figure b plots the ratio of ΔNPL to ROA against the aggregate share of loans extended to firms (in %) in 2004 by country. Figure c plots the ratio of DNPL to ROA against the aggregate share of loans extended to households (in %) in 2004 by country. The NPL ratios and the share of loans extended to firms resp. households are taken from the EBRD transition report. ROA is taken from the updated (2010) version of the Beck et al. (2000) financial structure database.

As an indicator of debt overhang in the banking sector we take the ratio of change in NPL to pre-crisis ROA. This indicator exceeds 30 for the Ukraine, while it is between 10 and 20 for

Lithuania, Hungary, and Georgia, and is just below 10 for Albania and Latvia. Thus, assuming that all the assets of Ukrainian banks are loans these banks would require more than 30 years of pre-crisis profits to cover the loan losses incurred during the crisis. By contrast banks in Estonia or Turkey could cover the increase in NPL during the crisis with 1 year of pre-crisis profits.

The analysis above suggests that banks in several transition countries are likely to struggle with the high NPL ratios they have accumulated during the crisis and the possible losses associated with such loans. One consequence might be a contraction in lending and the question that arises is whether firms or households would be more affected. To assess this, we take data on the share of private credit extended to firms and households from the EBRD transition report. On average across our sample of countries the share of private credit extended to firms is 58% (mean 2007-2009), ranging from 44% in Croatia to 76% in Slovenia. The share to households is thus on average 42% in our sample. We plot the severity of the NPL problem (change in NPL ratio / pre-crisis ROA) by country against the share of loans made to firms (Figure 4.3.b) or households (Figure 4.3.c) respectively.

Figures 4.3.b and 4.3.c show that the countries with the most severe NPL problems (Ukraine, Lithuania, Hungary, and Georgia) all have structures of lending that correspond to the sample average. In all of these countries the share of lending to firms is roughly 60%, while that to households is roughly 40%. This indicates that debt overhang in the banking sector of these countries is likely to affect both sectors, with firms slightly more affected than households.

Foreign Banks during the Crisis

Political as well as financial integration with Western Europe including a major presence of multinational banking groups had been the predominant model of development in most of the transition region since the mid-1990s. This model of cross-border finance had stimulated long-term growth (EBRD (2009)) and attenuated the effects of host country crises as foreign greenfield banks had kept their lending stable whereas domestic banks had been found to decrease lending (De Haas and Van Lelyveld (2006)). Thus, the availability of funds from internal capital markets made foreign banks in the transition region more resilient to host country crisis. However, the very same linkages included the risk of the transmission of a crisis from these banks' home countries to emerging Europe. Apart from that, foreign banks had been the drivers of an enormous credit boom including many foreign currency loans to often unhedged borrowers (EBRD (2010)). So how did foreign banks react to the 2007-2009 crisis? Did multinational banking groups contract their lending in the transition region because of financial problems at their parent banks thereby reinforcing the real effects of the crisis?

The empirical evidence so far is mixed. Popov and Udell (2010) find that the financial distress at foreign parent banks was indeed transmitted cross-border to emerging Europe leading to a reduction in lending to firms during the early stage of the crisis in 2007-2008. Their data on firms come from the 2009 wave of BEEPS (see section 4.1. for details). They match this data with information on bank presence in the localities of firms and bank balance sheet data from Bankscope. Although their dataset does not allow them to directly match firms with their banks, they can provide evidence that firms in localities served by foreign banks whose parents experienced financial distress have a higher probability to be credit constrained. Explicitly controlling for demand shifts and selection of firms out of the application process, they also find

that high-risk firms and firms with fewer tangible assets were more affected by this capital crunch.

While these findings indicate that multinational banks transmitted the crisis from their home to their host countries, Navaretti et al. (2010) find that such banks rather had a stabilizing effect on bank lending during the crisis. They use data from the Bank for International Settlements (BIS) for their aggregate analyses and balance sheet information from Bankscope for their micro-level analyses. On an aggregate level they find that, during the crisis, the share of local assets financed by cross-border funding increases in foreign affiliates. On the micro level, they find that foreign affiliates reduced the ratio of customer loans to customer deposits less during the crisis than domestic banks. They interpret their results as evidence for the well-functioning of the internal capital markets of multinational banking groups which supported local assets by cross-border funds.

Berglöf et al. (2009) point out that it is surprising that there were no systemic currency and banking crises observed in emerging Europe despite the high vulnerability of many countries (increased private sector indebtedness, currency mismatches) and the severity with which the crisis hit the region after the Lehman failure. In a country-level analysis using data from the BIS they find that foreign bank ownership mitigated bank lending outflows in the last quarter of 2008 and the first quarter of 2009.[13] Furthermore, they hint at the impact of the political and economic integration with Western Europe without explicitly testing it.

De Haas et al. (2011) use Bankscope data to assess the stability of bank lending in the transition region during the crisis years 2008-2009. Their results show that foreign bank subsidiaries decreased their lending earlier and faster than domestic banks whereas state-owned banks seemed to have been a relatively stable source of credit. They also analyze the impact of home-country government support for the parent banks on their lending activities in emerging Europe because this support might have come with requirements to focus on lending in their home markets. However, they do not find any impact of these support packages on lending of foreign bank subsidiaries in emerging Europe.

Finally, they study the impact of the so-called Vienna Initiative (VI), a coordination platform for multinational banks, International Financial Institutions, European Institutions as well as home and host country regulatory and fiscal authorities. During this process, multinational banks signed commitments to keep their subsidiaries capitalized in five countries. While this decreased fears of foreign bank withdrawal from these countries, it was not clear whether banks would not instead withdraw funds from other countries to keep up their exposure in the VI countries. They find that lending of foreign banks participating in the VI was somewhat more stable than lending of non-VI foreign banks. Moreover, their results do not hint at negative spillover effects since they do not find VI banks to withdraw from non-VI countries.[14]

[13] Mihaljek (2009) finds similar results also using country-level data from the BIS.

[14] Cetorelli and Goldberg (2011) show in a country-level study that in VI countries the contraction in domestic bank lending was attenuated.

Finding 4.3: Debt Overhang in the Banking Sector

- The strong increase the in non-performing loans (NPL) compared to pre-crisis bank profitability suggests that debt overhang in the banking sector is a threat in Ukraine, Latvia, Lithuania, Hungary as well as in Georgia and Albania.
- In the countries that face the most severe NPL problems, the share of private credit extended to firms (60%) and households (40%) is similar to the sample average. This suggests that debt overhang in the banking sector of these countries is likely to affect both sectors, with firms slightly more affected than households.
- The financial integration of Emerging Europe with the dominance of foreign banks seems to have contributed to the transmission of a crisis that had emerged unrelated to the local economic conditions. At the same time, this integration helped the region in managing the crisis by concerted actions of major players (Vienna Initiative, IMF and EU programs).

5. Policy Response

5.1 Policy Response to the Credit Boom Prior to the Crisis

Before the outbreak of the crisis regulators and policy makers had introduced various measures to deal with the credit boom in emerging Europe, in general, and with the increase in foreign currency lending, in particular. Panel A of Table 5.1 provides an overview of the measures taken to reduce credit growth in different countries throughout the transition region. The table reveals the variety of measures put into effect and shows that most countries used a mixture of several measures to address the problem of rapid credit growth and the inherent macroeconomic and financial stability risks. The aim of these measures was, in general, to both reduce the speed of credit growth and prevent a decline in credit quality (see Enoch and Oetker, 2007). The most widely used measures were monetary measures such as the tightening of reserve or liquidity requirements or increases in interest rates. Also, prudential and supervisory measures were popular. These included, for instance, closer monitoring of the risk management systems and asset quality of bank as well as closer and more frequent inspections. Administrative measures such as direct credit controls or fiscal measures were less used. In the case of administrative responses this could be explained by the distortions and costs which are associated with such policies. In Croatia, for instance, borrowers switched to less monitored and supervised non-bank financial institutions after direct credit controls were introduced (Hilbers et al. 2005). The absence of measures may simply be explained by the fact that the room for fiscal tightening was very small in most countries (Hilbers et al., 2005).

As discussed in section 4, the pre-crisis lending boom was accompanied by a substantial increase in foreign currency lending. Policy makers and regulators therefore took a range of measures to curb foreign currency lending. Panel B of Table 5.1 summarizes the monetary and regulatory/supervisory measures which were taken before the crisis hit emerging Europe. This panel shows that the most common means to reduce foreign currency lending taken before the crisis was aimed at the supply side by making foreign currency lending less attractive for banks. This took the form of higher risk weights for foreign currency loans in capital adequacy calculations or higher provisioning or reserve requirements on foreign currency lending.

Interestingly, in early 2007, the Baltic states experienced a cross-border supervisory intervention which meant that Swedish banks reduced their financing to their subsidiaries because Swedish home supervisors were increasingly concerned. This led to increased cross-border supervisory coordination and better information flow between home and host country supervisory authorities. Few countries addressed the demand side to reduce foreign currency borrowing by forcing banks to better inform borrowers about the risks involved in foreign currency loans or to tighten the eligibility criteria for such loans. An example is the so-called "Recommendation S" in Poland which required higher creditworthiness of borrowers taking out a foreign vs. local currency residential loan and advised banks to clearly disclose foreign currency risks to borrowers requesting foreign currency loans (see Zettelmeyer, Nagy and Jeffrey, 2010).

5.2 Policy Response since the Crisis

When the crisis hit emerging Europe, most countries (an exception was Ukraine) relaxed or eliminated the enacted regulations in response to the slowing down or reversing of foreign capital inflows in the months after the Lehman failure (see EBRD, 2010). However, since mid-2009 when recovery was felt to start off and regulators turned to concentrating on the systemic risks arising from foreign currency lending many countries have introduce a further range of macroprudential and administrative measures. Table 5.2 provides an overview hereof. Again, the most widely used measures aim at the supply side concerning higher capital or reserve requirements on foreign currency loans or limits on open foreign currency positions of banks, but several countries also introduced stricter eligibility criteria for foreign currency borrowers. While most countries relied on the introduction of a mixture of various policy measures, Hungary, Turkey and Poland made most extensively use of the available set of policy options. For instance, "Recommendation T" in Poland restricted the access to foreign currency loans for customers with lower income levels, improved the use of credit registries and required banks to provide even more information on risks of (foreign currency) loans to borrowers.

There are three countries – Hungary, Moldova and Ukraine - that totally banned certain forms of foreign currency lending. Ukraine banned foreign currency lending to households, while Hungary prohibited the registration of foreign currency mortgages. In Hungary, the mortgage market ceased as an outcome of this step because long-term local currency lending was not equally available. Attempts to foster local currency wholesale funding of banks had already been made before the crisis, e.g. with the creation of special purpose funds (see Abrams, 2008), but discussions about the development of domestic capital markets as a means to reduce foreign currency lending driven by foreign currency refinancing of banks have intensified now, especially in the course of the Vienna Initiative.

Apart from these measures, several governments introduced laws to improve the borrowers' situation vis-à-vis their banks and to shift the burden of the crisis to the banks. In this respect, Latvia introduced a new personal bankruptcy law considerably strengthening the position of the debtor and most likely leading to higher losses at banks (Box 5.1). Hungary introduced a guarantee for the payback of home credits for persons who have repayment difficulties because of increased debt servicing requirements (Molnar, 2010) and is currently close to concluding a mortgage relief plan including; e.g., the possibility for borrowers to extend their mortgage by up to five years without additional costs (Box 5.2). This comes on top of a bank solidarity tax for large banks which mostly affects foreign banks (see Kdrna, 2010).

Table 5.1. Policy Response to the Pre-Crisis Credit Boom

Panel A. Policy measures to curb credit growth

	ALB	ARM	BIH	BUL	HRV	CZE	EST	GEO	HUN	LTV	LIT	MDE	MDO	POL	ROM	RUS	SRB	SVK	SVN	TUR	UKR
Monetary measures																					
tightening of reserve requirements			X	X	X		X			X	X		X	X	X		X				X
tightening of interest rates					X					X				X	X						
Fiscal measures (fiscal tightening or reductions in fiscal incentives)				X	X		X								X						
Tightening of regulations and supervision			X	X	X		X			X	X		X	X	X		X	X			X
Market development measures (e.g. introduction of credit bureau)				X			X				X			X	X						
Moral suasion and communication tools				X	X		X			X	X			X				X			
Administrative measures (e.g. credit controls)				X	X									X				X			

Panel B. Policy Measures to Curb Foreign Currency Lending

	ALB	ARM	BIH	BUL	HRV	CZE	EST	GEO	HUN	LTV	LIT	MDE	MDO	POL	ROM	RUS	SRB	SVK	SVN	TUR	UKR
Higher risk weights, provisioning or reserve requirements depending on banks' fx exposure			X		X					X					X		X				
National Bank requires reserves for fx deposits to be held in fx													X								
Narrowing of interest differentials														X							
Increasing flexibility of exchange rate														X	X						
Cross-border supervisory intervention							X			X	X										
Monitoring fx risk					X	X			X	X					X						
Disclosing fx risks to customers									X					X							
Tightening of eligibility criteria for fx borrowing										X				X	X						

Source: Hilbers et al. (2005), Enoch and Oetker (2007).

Table 5.2. Policy Response to FX Lending After the Crisis

	ALB	ARM	BIH	BUL	HRV	CZE	EST	GEO	HUN	LTV	LIT	MDE	MDO	POL	ROM	RUS	SRB	SVK	SVN	TUR	UKR
Fx position limits	X	X		X	X			X		X		X				X	X			X	
Restrictions on fx lending		X								X		X	X	X						X	X
Higher capital, provisioning or reserve requirements for fx than local currency	X	X		X	X			X	X	X		X		X	X		X			X	X
Stricter LTV limits for fx									X					X							
Stricter measures of indebtedness for fx loans									X								X				
Stricter eligibility criteria for fx loans									X	X		X					X			X	
Codes of conduct discouraging fx use									X					X							
Enhanced customer disclosure of fx risks									X					X						X	
Deposit insurance favouring local currency deposits		X							X												
Central Bank or regulatory agency guidance to discourage fx use																				X	
Ban on fx lending									X				X								X

Source: EBRD (2010).

Box 5.1: Latvia—Personal Bankruptcy Law

In October 2009 the Latvian government proposed a mortgage loan plan that would limit the amount banks would be able to recover from defaulting mortgage holders. The plan included capping loan collections at the current value of the property rather than the value of the loan. Since property prices in Latvia had declined by around 70%, such a practice would have led to immense losses for banks, especially northern European banks such as Swedbank or Nordea which dominate the Latvian banking market. As most of the Latvian mortgage loans are denominated in Euro, this proposal was interpreted as a step to make devaluation of the local currency less hurtful by removing the risk that the debt burden of foreign currency borrowers would increase (Financial Times, 6 October 2009).

While the reproach that Latvia wanted to devalue its currency was immediately denied by its government, Swedbank reacted by threatening to withdraw business from the country if the plan was put into law although at the same time it expressed doubts that that would ever happen (Financial Times, 11 October 2009).

A new personal bankruptcy law to soothe the debt burdens of individuals and to allow them a fresh start was finally enacted in July 2010 after consultations between the government and the banks as well as the IMF and the EU had taken place. An earlier version of the law had been vetoed by the Latvian president because it had not distinguished between loans taken out to finance borrowers' own property and those to finance speculative investments in real estate. The law allows the scheduling of debt write-offs depending on a borrower's income and debt levels after the bankruptcy procedures. For instance, if a borrower can repay at least 50% (35%) of the debt after the bankruptcy procedure, i.e. the sale of the mortgaged property in most cases, the borrower's liabilities will be written-off after one year (two years) (Baltic Reports, 27 July 2010). While this means that banks have to bear higher losses, the Nordic banks do not expect severe impacts from the law because they have already set aside large provisions (Bloomberg, 27 July 2010). However, the law will probably make loans harder to get in the future and might therefore prolong the credit crunch and the economic recovery (Kudrna, 2010).

Box 5.2. Hungary—Bank Solidarity Tax and Mortgage Relief Plan

In July 2010 the Hungarian government passed a special solidarity tax on banks to be able to meet the deficit targets as agreed on with the IMF and the EU when negotiating the stabilization package. The solidarity tax amounts to a 0.5% levy on banks' year-end assets for a time span of three years from the end of 2009 onwards (The New York Times, 22 July 2010). While other countries also have such bank taxes, the Hungarian rate is considerably higher. Moreover, the tax mainly hits foreign banks as they are the larger banks and the tax only applies to banks whose annual fiscal revenue exceeds a certain threshold (Kudrna, 2010). Foreign parent banks had warned that the tax might lead to a contraction in lending and economic activity and also the EU and the IMF had opposed the tax believing that it would not solve Hungary's fiscal problems (Bloomberg, 25 June 2010 and 22 July 2010). The recent decision of the government to keep up the tax in unchanged form also in 2012 was followed by a statement of the chairman of the Hungarian Banking Association that this would lower banks' profitability and reduce lending (Reuters, 1 March 2011).

In addition to this, the government announced a mortgage relief plan to help distressed borrowers in September 2010 when risks that borrowers might default on their foreign currency loans increased due to the decline of the local currency against the Swiss franc. The proposal includes, for example, the possibility for borrowers to extend their mortgages by five years without any penalty and the ban for banks to levy additional fees for non-payment (Bloomberg, 16 September 2010). The plan met with banks' disapproval first, but in the following months the government and the banks worked together to come up with a mortgage relief plan that accommodates both sides. While the plan has not been enacted so far, it seems that the government plans to replace foreign currency loans of distressed borrowers with low-cost, state-subsidized loans (Budapest Business Journal, 6 April 2011).

5.3 Lessons from Past and Current Crises

Claessens et al (2011) compare financial resolution policies during the current crisis relative to previous crises.[15] These authors note that, while containment measures were quickly deployed, the current crisis, there has been much less by way of early restructuring of assets in comparison to previous crises. Moreover, the level of conditionality of support for banks has been much lighter than in previous crises. Taken together, this strategy has the potential to ultimately generate a high fiscal cost and intensified moral hazard risks in relation to future behavior.

An important factor differentiating the current crisis from previous crisis is that the size of banking system is larger relative to GDP in most countries. This has influenced policy choices along several dimensions. In relation to liability guarantees, these have been narrower in scope, with countries typically avoiding blanket guarantees (with the exception of Ireland). There has been a greater reluctance to crystallise loan losses, with stop-loss guarantees preferred to the creation of asset management companies (again, with the primary exception of Ireland). In addition, there have been fewer moves to isolate non-viable banks and impose operational restructuring, possibly for fear of contagion effects.

These choices can be understood in terms of limiting the upfront fiscal cost of resolving the banking crisis but carry the risk that the exit from the crisis will be delayed. For instance, Claessens et al (2011) are concerned that the restructuring of excessive household debts has not been very extensive, which may act as a drag on consumption growth. However, there is less

[15] See also Borio et al (2010).

concern about the corporate sector, since the corporate sector was generally not over-leveraged coming into the current crisis. (An exception is real estate firms in those countries which experienced construction booms.)

As noted above, Ireland has been an exceptional case during the current crisis. The extensive nature of its guarantee of the liabilities of the banking system in September 2008 is recognised as having been costly in terms of raising the fiscal cost of the banking crisis (Honohan 2010). The establishment of the National Asset Management Agency (NAMA) was intended to cleanse the banking system of the development property loans that were at the heart of the banking crisis. This was a textbook move in many respects (Fung et al 2004, Honohan and Laeven 2006). However, the scale of the crystallised losses for the banking system was so big that it required very large upfront recapitalisations by the government and was a key factor in the loss of market confidence in the sustainability of the sovereign debt in Autumn 2010 (Lane 2011).

In relation to the restructuring of household and corporate debts, Laeven and Laryea (2009) and Laryea (2010) provide useful primers. As noted by these authors, there are several levels of policy interventions that are possible.

At one level, the role of public policy might be simply to ensure that the legal system facilitates the restructuring of private-sector debts through the optimal design of bankruptcy procedures and efficient operation of the courts system. Park (2001) reviews the East Asian experience with corporate restructuring and emphasises the value of procedural reforms such as the improvement of workout codes, the facilitation of debt/equity conversions and the recognition of out-of-court settlements.

However, even if a reform improves the steady-state efficiency of the private-sector financial system, a shift in regime in the aftermath of the accumulation of high debt shifts the bargaining power between creditor and debtor. Accordingly, there may be resistance to mid-crisis structural reforms, given that the original terms of these loans did not envisage a shift in the legal system within the lifetime of the existing loans.

Moreover, if debt problems are very extensive and similar in nature across individual loans, a fully-decentralized approach will lead to congestion of normal bankruptcy mechanisms. Rather, it may be efficient to design a debt restructuring model that can serve as a template for restructuring individual loans.

As outlined by Laeven and Laryea (2009), such a program should have the objective of converting troubled loans into performing loans, while mitigating moral hazard problems. In terms of scope, a program should ensure that the restructured debts of the targeted group should be sustainable, while taking into account the fiscal position and ensuring that the allocation of burden sharing between creditors and debtors is aligned with the ability of each group to absorb losses. Voluntary participation is essential if legal challenges are to be avoided, while the program should be based on simple rules and verifiable information. Finally, ensuring transparent and accountable operation of the program is important to ensure legitimacy and protect taxpayers.

In relation to government-sponsored programs, additional factors also are relevant. In general, the government should provide incentives to debtors and creditors in order to take into

account various externalities in debt workouts. For instance, in relation to housing debt, the costliness of the repossession process means that both debtors and creditors could be given incentives to minimize avoidable repossessions.

In relation to corporate restructuring, Claessens et al (2001) review corporate restructuring policies from eight crises. In broad terms, these authors find that corporate recovery was indeed more rapid with fiscal interventions to support the banking sector (such as liquidity support, liability guarantees and the creation of an asset management company). However, these authors caution that the taxpayer cost of these interventions was high and the net growth impact is unclear.

A common theme in relation to the restructuring of corporate and household debt is that this is much more feasible if banks are sufficiently well capitalized to recognize losses. In turn, this may require fiscal interventions to provide extra capital to the banking system. In this regard, Kalemli-Ozcan et al (2011) provide evidence from six Latin American countries over 1990-2005. These authors show that it is the health of the banking sector that is the key factor in determining whether the investment behavior of firms is constrained by financial shocks such as large currency depreciations.

Buffie (1989) describes the FICORCA scheme introduced in Mexico in the 1980s. This scheme was targeted at firms struggling with foreign-currency debts in the wake of peso devaluations. The design of the scheme had it that firms did not receive any NPV subsidy, since lower initial peso payments would be offset by higher late-stage payments. In Buffie's judgement, this scheme avoided a chain of bankruptcies. Laeven and Laryea (2009) provide further case studies of restructuring schemes.

5.4 Assessment of Current Policy Measures in Emerging Europe

Our analysis of debt overhang in Emerging Europe points to six main findings:

External balance sheets: The external imbalance problem has been more one of flows (high current account deficits in the pre-crisis years) rather than large stocks of external debt in most cases. Equity funding means that net external debt is far lower than net external liabilities. Current account deficits have narrowed quite rapidly in most countries.

Aggregate domestic balance sheets: Although sectoral balance sheets have expanded rapidly, sectoral liabilities remain relatively low compared to advanced economies. However, the rapid expansion in credit does suggest that non-performing loans could be problematic, due to deterioration in loan quality during intense credit booms.

Governments: With the main exception of Hungary, public debt levels remain relatively low in Emerging Europe. So long as the debts of other sectors are not socialized, the risk of sovereign debt crises in these countries is low compared to many advanced economies.

Firms: Debt overhang poses a particular threat to activity in the tradable sector in the more advanced economies of the region. By contrast, the impact of corporate borrowing in foreign currency is negligible.

Households: Excessive leverage and exposure to FX borrowing are relevant only for a minor share of households in the region. Debt overhang does not seem to pose a threat to aggregate investment and consumption in the household sector in any particular country.

Banking sector: Substantial levels of non-performing loans suggest that debt overhang may constrain future lending in several countries (e.g. Latvia, Hungary).

The above analysis suggests that the majority of policies taken by authorities in the region hardly address growth constraints arising from debt overhang:

Authorities in most countries have focused on **policy measures to curb FX lending** and cushion the effects of exchange rate depreciations on existing FX borrowers, especially in the household sector. Our analysis suggests that these will have little effect on aggregate investment and consumption in the private sector. Indeed it is even questionable whether these measures are well targeted to deal with systemic risk in the banking sector. Recent data from the Hungarian Central Bank, for example, show that the share of non-performing loans is twice as high for local currency loans (12%) than for foreign currency loans (just over 6%). This suggests that the systemic risk to the banking sector in Hungary is currently arising from the real economy rather from foreign currency denominated lending.

Authorities in selected countries (e.g. Latvia and Hungary) have taken measures to **shift the burden of debt from households to banks**. These measures seem to be counterproductive in view of future economic growth: the marginal debt levels of households in the region suggests that over-indebtedness will hardly constrain economic activity in the household sector, while debt overhang in the banking sector seems to already pose a greater threat. From the viewpoint of social policy, the "relief" measures for the household sector also seem misguided as those households with mortgage debt are the more wealthy ones.

Should authorities in the region then take measures instead to shift the debt burden away from the banks instead? Should they follow the example of some industrialized countries in the recent crisis and East Asian countries at the end of the 1990s by using public funds to **take "toxic" assets off banks' balance sheets**? Our view is that such measures may not be necessary: those countries in the region that have experienced substantial losses in the banking sector are also characterized by a dominance of foreign-owned banks. As illustrated in section 4.3, these banks have shown the ability and willingness to support their subsidiaries in Emerging Europe even in times when they were facing substantial challenges in their home markets. It seems plausible that these international banks will provide continued support to their subsidiaries in terms of the necessary capital and debt funding. Finally, it seems both politically and economically infeasible that authorities in Emerging Europe could use taxpayer funds to subsidize the activities of foreign-owned banks.

References

Abrams, J. 2008. Recent developments in microfinance foreign exchange risk management. Geneva Papers on Inclusiveness No. 7.

Aguiar, Mark, Manuel Amador and Gita Gopinath 2007. "Sovereign Debt Cycles", NBER Working Paper 13353.

Arellano, Cristina and Naryana Kocherlakota 2008. "Internal Debt Crises and Sovereign Default," Federal Reserve Bank of Minneapolis.

Arslanalp, Serkan and Peter Blair Henry 2004. "Is Debt Relief Efficient?," NBER Working Paper No. 10217.

Beck, T., M. Brown 2010. Which Households Use Banks? Evidence from the Transition Economies. European Banking Center Discussion Paper No. 2010-25.

Berglöf E., Y. Korniyenko, A. Plekhanov and J. Zettelmeyer 2009. Understanding the crisis in emerging Europe. EBRD Working Paper 109.

Bolton, Patrick and Olivier Jeanne 2007. Structuring and restructuring sovereign debt: The role of a bankruptcy regime. IMF Working Paper, WP/07/192, 2007.

Borio, Claudio, Bent Vale and Goetz von Peter 2010. Resolving the Financial Crisis: Are We Heeding the Lessons from the Nordics? BIS Working Paper No. 311.

Brown, M., T. Jappelli, M. Pagano, 2009. "Information sharing and credit: Firm-level evidence from transition countries," *Journal of Financial Intermediation*, 18, 151-172.

Brown, M., Kirschenmann, K., Ongena, S., 2010. Foreign currency loans - Demand or supply driven? CEPR Discussion Paper 7952

Brown, M., Ongena, S., Popov, A., Yeşin, P., 2011a. "Who needs credit and who gets credit in Eastern Europe?," *Economic Policy* 26, 93-130.

Brown, M., Ongena, S., Yesin, P., 2011b. "Foreign currency borrowing by small firms in the transition economies," *Journal of Financial Intermediation* 20, 285-302.

Budina, Nina, Gaobo Pang and Sweder van Wijnbergen 2007. "Nigeria's Growth Record: Dutch Disease or Debt Overhang?," World Bank Policy Research Working Paper 4256.

Buffie, Edward 1990. "Debt Management and Negotiations," in (Jeffrey D. Sachs, editor) Developing Country Debt and Economic Performance, Volume 2: The Country Studies – Argentina, Bolivia, Brazil, Mexico, NBER.

Cerra, Valerie, and Sweta Chaman Saxena 2008. "Growth Dynamics: The Myth of Economic Recovery," *American Economic Review* 98(1), 439–457.

Checherita, Christina and Philipp Rother 2010. The impact of high and growing government debt on economic growth: An empirical investigation for the euro area. ECB Working Paper Series 1237.

Claessens, Stijn, Ishac Diwan and Eduardo Fernandez-Arias 1992. Recent Experience with Commercial Bank Debt Reduction. World Bank Policy Research Working Paper No. 0995.

Claessens, Stijn, Daniela Klingelbiel, and Luc Laeven 2001. Financial restructuring in banking and corporate sector crises: What policies to pursue? NBER Working Paper 8386.

Claessens, Stijn, Ceyla Pazarbasioglu, Luc Laeven, Marc Dobler, Fabian Valencia, Oana Nedelescu, and Katherine Seal 2011. Crisis management and resolution: Early lessons from the financial crises. IMF Staff Discussion Note 11/05.

Cordella, Tito, Luca Antonio Ricci, and Marta Ruiz-Arranz 2005. Debt overhang or debt irrelevance? revisiting the debt-growth link. IMF Working Paper 05/223.

Coricelli, F. & N. Driffield, S. Pal, I. Roland, Isabelle 2009. Excess Leverage and Productivity Growth in Emerging Economies: Is There A Threshold Effect? CEPR Discussion Papers 7617.

Cottarelli, Carlo, Lorenzo Forni, Jan Gottschalk and Paolo Mauro 2010. Default in Today's Advanced Economies: Unnecessary, Undesirable and Unlikely. IMF Staff Position Note SPN/10/12.

De Haas, R. & I. van Lelyveld 2006. "Foreign banks and credit stability in Central and Eastern Europe. A panel data analysis," *Journal of Banking & Finance*, 30, 1927-1952.

De Haas, R., D. Ferreira, A. Taci 2010. "What determines the composition of banks' loan portfolios? Evidence from transition countries," *Journal of Banking & Finance*, 34,388-398.

De Haas R., S. Knobloch 2010. In the wake of the crisis: dealing with distressed debt across the transition region. EBRD Working Paper 112.

De Haas R. Y. Korniyenko, E. Loukoianova, A. Pivovarsky 2011. Foreign Banks During the Crisis: Sinners or Saints? European Bank for Reconstruction and Development.

Diwan, Ishac and Dani Rodrik 1992. External Debt, Adjustment, and Burden Sharing: A Unified Framework. Princeton Studies in International Finance No. 73.

Dooley, Michael P. 1986. An Analysis of the Debt Crisis. IMF Working Paper /86/14.

Dooley, Michael P. and Lars E.O. Svensson 1994. "Policy Inconsistency and External Debt Service," *Journal of International Money and Finance* 13(3), 364-374.

Dziobek, Claudia and Ceyla Pazarbasioglu 1997. Lessons from systemic bank restructuring: A survey of 24 countries. IMF Working Paper 97/161.

Enoch C., I. Robe (eds) 2007. *Rapid Credit Growth in Central and Eastern Europe*, Houndmills: Palgrave Macmillan.

European Bank for Reconstruction and Development 2010. Transition Report 2010. Recovery and Reform, London.

Fidrmuc J., M. Hake, H. Stix 2011. Households' Foreign Currency Borrowing in Central and Eastern Europe, Oesterreichische Nationalbank.

Fischer, Stanley 1989. "Resolving the International Debt Crisis," in (Jeffrey D. Sachs, editor) Developing Country Debt and Economic Performance, Volume 1: The International Financial System, NBER.

Fung, Ben, Jason George, Stefan Hohl and Guonan Ma 2004. Public Asset Management Companies in East Asia: A Comparative Study. Financial Stability Institute Occasional Paper No. 3, BIS.

Furceri, Davide and Annabelle Mourougane 2009. The Effect of Financial Crises on Potential Output: New Empirical Evidence. OECD Economics Department Working Paper No. 699.

Gorodnichenko, Y., Schnitzer, M., 2010. Financial constraints and innovation: Why poor countries don't catch up? NBER Working Paper.

Herzberg, V., 2010. Assessing the Risk of Private Sector Debt Overhang in the Baltic Countries, IMF Working Paper 10/250.

Hilbers, P., Ötker-Robe, I., Pazarbasioglu, C. and Johnsen, G. 2005. Assessing and Managing Rapid Credit Growth, and the Role of Supervisory Authorities. IMF Working Paper.

Honohan, Patrick 2010. The Irish Banking Crisis – Regulatory and Financial Stability Policy 2003-2008. Commission of Investigation into the Banking Sector in Ireland.

Honohan, Patrick and Daniela Klingelbiel 2001. Controlling the fiscal costs of banking crises. The World Bank, 2001.

Honohan, Patrick and Luc Laeven 2006. *Systemic Financial Crises: Containment and Resolution*, Cambridge University Press.

Imbs, J. and R. Ranciere 2008. The Overhang Hangover. Paris School of Economics.

International Monetary Fund 2009. What's the Damage? Medium-Term Output Dynamics after Financial Crises. World Economic Outlook (April), 121-151.

Kalemli-Ozcan, Sebnem, Herman Kamil and Carolina Villegas-Sanchez 2011. What Hinders Investment in the Aftermath of Financial Crises: Insolvent Firms or Illiquid Banks? NBER Working Paper No. 16528.

Kirsanova, Tatiana Gordon Menzies and David Vines 2007. Stiglitz Versus the IMF on the Asian Debt Crisis: An Intertemporal Model with Real Exchange Rate Overshooting. CEPR Discussion Paper 6318.

Kraay, Aart and Vikram Nehru 2003. When Is Debt Sustainable? The World Bank.

Krugman, Paul 1988. "Financing versus Forgiving Debt Overhang," *Journal of Development Economics* 29, 253-268.

Kudrna, Z. 2010. Financial crisis: Testing the relationship between banks and the new EU members. Emecon: Employment and Economy in Central and Eastern Europe 1, 1-19.

Kumar, Manmohan S. and Jaejoon Woo 2010. Public Debt and Growth. IMF Working Paper 10/174.

Laeven, L. and T. Laryea 2009. Principles of Household Debt Restructuring. IMF Staff Position Note 09/15.

Lane, Philip R. 2011. The Irish Crisis. IIIS Discussion Paper No. 356.

Lane, Philip R. and Gian Maria Milesi-Ferretti 2004. "The Transfer Problem Revisited: Real Exchange Rates and Net Foreign Assets," *Review of Economics and Statistics* 86, 841-857.

Lane, Philip R. and Gian Maria Milesi-Ferretti 2007a. "The External Wealth of Nations Mark II: Revised and extended estimates of foreign assets and liabilities, 1970–2004," *Journal of International Economics* 73, 223-250.

Lane, Philip R. and Gian Maria Milesi-Ferretti 2007b. "Capital Flows to Central and Eastern Europe," *Emerging Markets Review* 8(2), 106-123.

Lane, Philip R. and Jay C. Shambaugh 2010. "Financial Exchange Rates and International Currency Exposures," *American Economic Review* 100(1), 518--540.

Larrain, Felipe and Andres Velasco 1990. Can Swaps Solve the Debt Crisis? Lessons from the Chilean Experience. Princeton Studies in International Finance No. 69.

Laryea, Thomas 2010. Approaches to corporate debt restructuring in the wake of financial crises. IMF Staff Discussion Note 10/02.

Luca, A., and I. Petrova 2008. 'What drives Credit Dollarisation in Transition Economies?',

Journal of Banking & Finance, 32, 858-869.

Manzano, Osmel and Roberto Rigobon 2001. Resource Curse or Debt Overhang? NBER Working Paper 8390.

Melzer, Brian 2010. Mortgage Debt Overhang: Reduced Investment by Homeowners with Negative Equity, Kellogg School of Management.

Molnár, M. 2010. Enhancing financial stability through better regulation in Hungary. OECD Economics Department Working Papers, No. 786, OECD Publishing.

Mulligan, Casey B. 2008. A Depressing Scenario: Mortgage Debt Becomes Unemployment Insurance. NBER Working Paper 14514.

Myers, S., 1977. "The Determinants of Corporate Borrowing," *Journal of Financial Economics*, 5, 147-175.

Navaretti G.B., G. Calzolari, & A. F. Pozzolo & M. Levi 2010. "Multinational banking in Europe - financial stability and regulatory implications: lessons from the financial crisis." *Economic Policy*, 25, 703-753.

Occhino, Filippo and Adrea Pescatori 2010. "Debt Overhang in a Business Cycle Model," FRB Cleveland Working Paper 10-03R.

Olney, Martha L. 1999. "Avoiding Default: The Role of Credit in the Consumption Collapse of 1930," *Quarterly Journal of Economics* 114(1): 319-335.

Panetta, Fabio Thomas Faeh, Giuseppe Grande, Corinne Ho, Michael King, Aviram Levy, Federico M. Signoretti, Marco Taboga, and Andrea Zaghini 2009. An assessment of Financial sector rescue programmes. BIS Papers 48.

Panizza, Ugo, Federico Sturzenegger, and Jeromin Zettelmeyer 2009. "The economics and law of sovereign debt and default," *Journal of Economic Literature* 47(3), 651-698.

Park, Yung Chul 2001. The East Asian Dilemma: Restructuring Out or Growing Out? Princeton Essays in International Finance No. 223.

Philippon, T., and P. Schnabl 2009. Efficient Recapitalization. NBER Working Paper 14929.

Popov, A., Udell, G. F., 2010. Cross-border banking and the international transmission of financial distress during the crisis of 2007-2008. ECB Working Paper 1203.

Powell, Andrew 2011. Debt Restructuring: Lessons from Latin America. VOX.LACEA.

Ranciere, Romain, Aaron Tornell and Athanasios Vamvakidis, 2010. "Currency mismatch and systemic risk in Emerging Europe," *Economic Policy* 25, 597-658.

Reinhart, Carmen and Kenneth Rogoff 2010. "Growth in a Time of Debt," *American Economic Review* 100 (2), 573–578.

Sachs, Jeffrey D. 1989. "Conditionality, Debt Relief, and the Developing Country Debt Crisis," in (Jeffrey D. Sachs, editor) Developing Country Debt and the World Economy, U Chicago Press.

Shleifer, Andrei 2003. "Will the Sovereign Debt Market Survive?," *American Economic Review* 93(2), 85-90.

Zettelmeyer, J., P. Nagy, and S. Jeffrey 2010. Addressing Private Sector Currency Mismatches in Emerging Europe. EBRD Working Paper 115.